

THE INDEPENDENT GUIDE TO IBM PERSONAL COMPUTERS

NEW:
1-2-3
CLINIC



Volume 4 Number 6

\$2.95

March 19, 1985

Maintaining Your IBM

• Troubleshooting
• Cures
• Prevention

Cheap Programs
To Make You Rich

Price Waterhouse
Report: Accounting
With Dow Jones



Programming:
Move Files Fast



COM
CL

DR. MI
DR. CH

The power
behind your PC is
right behind
this page.

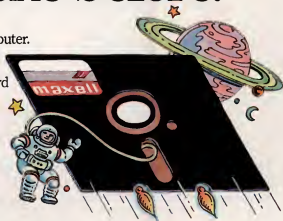


Maxell Gold.

The floppy disk that
packs more facts
into Compaq,
sets HP® free,
and takes IBM®
Portable where it's
never gone before.

It's great to have a portable computer. Especially when your data stays put. For error-free performance at home or abroad, trust Maxell. The Gold Standard in floppy disks. There's a Maxell disk for virtually every computer made. Each is backed by a lifetime warranty. Maxell. Accepted everywhere, without reservation.

maxell.
IT'S WORTH IT.®



SOFTWARE SHOULDN'T MAKE YOU FEEL FOOLISH.



INTRODUCING ABILITY.™

**THE BUSINESS SOFTWARE THAT
WORKS WITH YOU. NOT AGAINST YOU.**



Choosing business software can really be a circus. Sometimes all the jokes seem to be at your expense.

But there's no need to clown around anymore with hard to learn programs. Now you have the ABILITY™.

Like a welcome blast of clean, fresh air, ABILITY is the new business software for the 80's. If you care about excellence, but don't feel like marrying a computer to get it: ABILITY is for you.

This is a program smart enough to help you do significant things with ease. Without having to go through foolishness first. And ABILITY is made to be learned in less than a day.

Look at the menu screen above and see what we mean. The entire program is quick, and understandable. A pleasure to use.

A reminder line's always on your screen, to show you exactly where you are and what you can choose next. And, when you want it, help is yours in a key stroke.

Easy? Definitely.

But this product is also very powerful.

ABILITY includes spreadsheet, database, word processing, telecommunication, graphs –and “Presentation!”, an exclusive feature to present ideas with new impact.

ABILITY has complete integration of all these functions (not just partial like some). That bit of hard work on our part means it's easy for you to use one function with another.

Like words with graphs, or all of it with telecommunications.

In fact, ABILITY gives you the versatility that many competitors lack. The more you know about the others, the more you'll be impressed with ABILITY.

Powerful. But powerful enough to be easy.

	ABILITY	SYMPHONY	FRAMEWORK
Data Base	Limited by Disk Size Only	Limited by RAM	Limited by RAM
Memory required to load full product	256K RAM	320K RAM	384K RAM
“Snapshot” screens to custom-make separate presentation disk	Yes	No	No
Suggested retail price	\$495	\$695	\$695

For more information about ABILITY, the most significant business software available, see the expert at your computer products store. Try it out. We think you'll be very pleased.



FREE DATABASE

MANAGEMENT SYSTEM 4:
Includes Accounting, Payroll,
Inventory & A/R Applications

PROGRAMMABLE RELATIONAL FULL VERSION NOT A DEMO

- Report Generator
- Manual is on disk
- Customizable Screens
- ASCII Output

- Written in Basic for easy modification
- Report Generator
- Subroutines

- Start on 3 Fields
- Subroutines
- Relational Price

- Over 10,000 Lines of Source Code Given
- 14 Files to Calculate Fields
- Global Field Changes

- Real time updates between files
- Transfer Data between files
- A user supported program

- Recommended by Barton's Microcomputing Journal, Houston Area League of PC Users & Professionals in its first issue

AND SPREADSHEET

PROGRAMMABLE FULL VERSION NOT A DEMO

- 21 ways to calculate numbers or write your own
- Subroutines

- Written in Basic for easy modification
- Complete Version Provided (250)

- Sample Database & Income Tax Applications
- Numbers & Text may be placed anywhere on the screen

- Automatic Recalculation
- Screen Updates

- Graphics, Bar Charts
- Full Cursor Control

AND EXPERT SYSTEM

INFERENCING ENGINE
PROGRAMMABLE FULL VERSION NOT A DEMO

- Design your own Expert System
- Diagnose Multiple Problems

- Generate Multiple Reports
- Explain Problems with Rules

- Intelligent Search Pattern with Manual Overrides
- Logic Path through Subroutines

- Generate Conclusions/Explanations
- Explanation of Reasoning

- Access Unknown Input
- Source Code & Compiled Version (180K)

- Written in Basic for easy modification
- Sample Application

- The Foremost in Applications

SUPERIOR IN SEVERAL AREAS

You get the source code in Basic. We write the program in Basic because most users, like you, already know how to program in Basic. You can use your time learning an inferior one language "language" like Fortran or Algol. With the source code you can modify the system in all ways that can be done in Basic.

You do not have to be a software engineer to use the system. The entire system is menu driven. You do not have to learn hundreds of commands. You do not have to learn reading the manual every all the options are displayed on the screen.

If you write any application programs in Basic you can reduce your programming time by 50% or more. You probably waste 50% to 80% of your time editing the program, of data, storage of the data or file, retrieval of data, correction of data, management and other tedious tasks. By using the database or spreadsheet to handle your repetitive work you will reduce your programming time by 50% or more. There are no royalties on applications.

- For IBM PC, XT or AT with IBM
- PC AT with IBM & Compaq Basic
- Compatible with IBM & Microsoft Basic

NO STRINGS ATTACHED

You do not have to buy anything else to use the system. We don't want any software license for the use of the files & hardware. We developed the programs in house for our own use. We are not selling the programs because we do not want to be in the software publishing business. We are giving the programs away as a public service & for the good publicity. The 500 has saved the rest of the 4 disk and the advertising at us not having any money left after.

MORE FREE SOFTWARE ON PAGE 331

PPE
POTOMAC PACIFIC ENGINEERING INC.
Box 3807 Gaithersburg, MD 20878 (301) 471-1400

- * Copy the system from someone who already has one OR
- * Buy the latest most powerful edition save 50% to save the cost of a 2.500 disk 144 sides read, write, erase, reformat & formatting
- * Available on 8 500 disk, 5.25 disk
- * Includes USA and 1440 and 1440 and 512
- * Allow 2 to 3 weeks for delivery

Please send the Database of Basic, the "Spreadsheet of Basic" and the Expert System of Basic to:

Name _____

Street _____

City/State/Zip _____



PUBLISHER	Jeff Weiner
EDITOR	Bill Macdonald
EXECUTIVE EDITORS	Mike Eickholt, Paul Somerson
MANAGING EDITOR	Bary Owen
TECHNICAL EDITOR	Craig L. Stark
ASSISTANT MANAGING EDITORS	Pony Gering, Laura Simcoe, Gus Venduto
ASSOCIATE EDITORS	Jennifer de Jong, Lisa Kleinman, Barbara Krasoff, Stephanie Stalings
SENIOR EDITOR, PC NEWS	Don Kennedy
SENIOR COPY EDITORS	Jean Andrich, Janet Lewis
TECHNICAL COORDINATOR	Michael O'Connell
PRODUCTION EDITOR	Paul Ross
ASSISTANT EDITORS	Charles Barnett, Gerald Carney, Victoria Danoff, Virginia Delek, Michael Esparde, Cheryl Goldberg, James Langfield, Jane Master, David O'Brien, Ann Owsen, Greg Pasnick, Fredric Paul, David Baker, Chaimson Oung
EDITORIAL ASSISTANTS	Iris Knut
OFFICE MANAGER	Carolyn Jones
RECEPTIONIST	Richard Aaron, Frank J. Derfer, Jr., John Dickinson, Will Furdie, Glenn Hart, Stephen Miron, Peter Norrie, Maria Pomer, Wase L. Rosh, Corey Sandier, Craig Simon, Judd Taylor, Robin Webster
CONTRIBUTING EDITORS	
DESIGN DIRECTOR	Patricia J. Blank
ART DIRECTORS	Mary Zink, Gerald Kunkel
ART EDITOR	Marlene Nicolson
ASSOCIATE ART DIRECTOR	Mark Jensen
ASSISTANT ART DIRECTORS	Roslyn Maguire, Louise White
MECHANICAL ARTISTS	Monique Culbertson, Bina Goodheart, Sara Whitford
PRODUCTION ARTIST	Susan Abrams
ADMINISTRATIVE ASSISTANT	Lisa Barnabe
PUBLIC RELATIONS MANAGER	Jessica Kenney
CIRCULATION MANAGER	Tom A. Heffling
CIRCULATION ASSISTANTS	A. Hugh Kraft, Mickey Kneger
ADVERTISING DIRECTOR	Eugene Duncan
DISTRICT MANAGERS	
NORTHERN CALIFORNIA AND NORTHWEST	Jeff Cohen, David Engler (415) 596-2290
SOUTHERN CALIFORNIA, L.A. AREA	Barbara Faris (213) 387-2100
ORANGE COUNTY, CA. AND SOUTHWEST	Peggy Matthews (213) 387-2100
NEW ENGLAND	Kathy Krueh (213) 387-2100
NEW YORK, NEW JERSEY AND FLORIDA	Ellen Adelman (212) 503-5307
MIDWEST	John Hennrich (312) 346-2600
MIDATLANTIC AND SOUTHEAST	Bob Ormrod (212) 503-5308
ADVERTISING SALES MANAGER/TELEMARKETING	Pauline Scherer
ACCOUNT REPRESENTATIVES	Steve Anderson, Janet Bell, Joanne Broome, Sue Johnson, Jane Lucio, Laura Morse, Pat Tooley
ADVERTISING COORDINATORS	Helen Fongstad, Scott E. Pearl
ASSISTANT TO THE PUBLISHER	Suzanne N. Silver

ADVERTISING OFFICE
Ziff-Davis Publishing Company, One Park Avenue,
New York, NY 10016, (212) 503-5300

FOUNDER
Anthony Gold

COMPUTER PUBLICATIONS DIVISION

PRESIDENT	Kenneth H. Koppel
SENIOR VICE PRESIDENT	Edmund G. Markowitz
VICE PRESIDENT, EDITORIAL	Joseph Lazzaro
VICE PRESIDENT, PRODUCTION	David Davis
VICE PRESIDENT, LICENSING & SPECIAL PROJECTS	Jerry Schneider
VICE PRESIDENT, CREATIVE SERVICES	Robert Stern
VICE PRESIDENT, CIRCULATION	Alana Marie Jvan
VICE PRESIDENT, CIRCULATION SERVICES	James Ramsey
MARKETING MANAGER	Rosanne Sorenberg
BUSINESS MANAGER	Mary A. Gaudin
EDITORIAL DIRECTOR	Emmet F. Baxter

ZIFF-DAVIS PUBLISHING

President Richard P. France, Senior Vice President Philip T. Hoffman, Senior Vice President Philip Sine, Vice President William Phillips, Treasurer Sherry Tashman, Secretary Brian Adams

PC: The Independent Guide to IBM Personal Computers (ISSN 1070-2088) is published bi-monthly for \$3.97 for one year (24 issues), \$6.97 for two years, and \$9.97 for three years. Annual subscription \$48.00 for Canada and all other foreign countries. PC Communications Corp., a subsidiary of Ziff-Davis Publishing Co., One Park Ave., New York, NY 10016. Second-class postage paid at New York, NY 10016 and at additional mailing offices. POSTMASTER: Send address changes in PC to Ziff-Davis Publishing Co., One Park Ave., New York, NY 10016. Editorial (212) 503-5300. Advertising (212) 503-5300. For subscription inquiries and service, write to PC Magazine, P.O. Box 1340, Boulder, CO 80521. PC is an independent print, not affiliated in any way with International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corp. IBM contains Copyright © 1989 PC Communications Corp. All rights reserved. Reproduction in whole or in part without permission is prohibited. The following are trademarks of PC Communications Corp.: PC: The Independent Guide to IBM Personal Computers, PC Mail, PC Lab, PC Communications, PC PC, PC User, PC User PC, BookLink, Custom User PC, News. Periodicals: Material in this publication may not be reproduced in any form without permission. Requests for permission should be directed to Jane Lewinstein, Ziff-Davis Publishing Company, One Park Ave., New York, NY 10016. Editorial Communications may be addressed to SOURCE BUREAU, Communication 7129, 713, or MCI Mail 157-0981. PC Bulletin Board (212) 503-5300.





“What do we mean by *honest* accounting software?”

We mean software that does what it says it will do; it works in the real world.

What does RealWorld™ accounting software do?

Our fully integrated accounting line offers General Ledger, Accounts Receivable, Accounts Payable, Order Entry, Inventory Control and Sales Analysis as honest solutions to your accounting problems. Our software runs on most popular micro-computers.

RealWorld software has been designed to suit your business accounting needs. Our software is built on the actual live feedback collected from our dealers and users over the last ten years.

An installed base of over 80,000 satisfied users has kept us in touch with the true needs of business accounting in the real world. An independent survey of computer retailers rated us #1 in technical performance, documentation, user friendliness, features and adaptability.

See for yourself what RealWorld can do

Seeing is believing—go to your local computer dealer and get a live demonstration of our software. You can enter real data about your real life accounting problems and see the results for yourself.

Insist on the accounting software that does what it says it will do. RealWorld is available at most major computer stores, or call us direct for the number of the dealer nearest you. Or send us the coupon below and we will mail the information to you without delay.



RealWorld Corporation
Dover Road
Chichester, N.H. 03263

1-603-225-9565

RealWorld is a trademark of RealWorld Corporation

I'd like more information about the Accounting Software that does what it says it will do and the name, address and phone # of the computer store nearest me that has RealWorld Accounting Software.

Name

Company

Address

City State

Zip Code Phone #

Hardware

Type of Business

PC001000



The Independent Guide to IBM Personal Computers

VOLUME 4 NUMBER 6
MARCH 19, 1985

COVER STORIES

Whatever Ails Your PC 114

**Maintain Your Sanity:
Maintain Your Disk Drives** 116
Henry F. Beechhold/Disk drive failure is a primary source of computer breakdowns. To keep your repair bills low, learn how the drives work, how to keep them working, and how to troubleshoot when your PC does break down.



Circuit Board Home Remedies 124

Gene B. Williams/The PC's diagnostics can help you give your computer a full check-up when its circuit boards are sick.

Power Plays and Peripherals 130

Gene B. Williams/When power is the problem or your PC peripherals just won't perform, here's how to get going again.

Taking Out a Contract on Your PC 136

Wendy Lea McKibbin/Making the right move in the maintenance market can be a confusing proposition. Here's how to choose the service contract that's best for your system.

Keeping the Repairman Away 142

Dorothea Atwater/Avoid costly PC repairs with preventive maintenance. This checklist of easily fixed problems will help.



FEATURES

LANGUAGES A Grand SLAM for Simulations 148

Jan B. Young/SLAM II is a simulation language that cuts down on programming and processing time. Its results are more reliable than those attained with general-purpose languages.

THE PRICE WATERHOUSE REPORT Dow Jones Does the Books 162

G. William Dauphinais and Michael A. Yesko/Dow Jones & Company is synonymous with American business. For its first venture in micro software publishing, it has introduced general accounting packages aimed at small business managers who want to automate their financial systems.

SOFTWARE Speed Through the Reading Barrier 175

Dara Pearlman/You can double or triple your reading speed if you let a PC do the coaching.

Software for the Hard Sell 194

Frank Vaughan/Clinching the deal is a lot easier with the aid of four new software programs that turn the difficult art of selling into a more manageable endeavor.

Modest Investments Yield Large Returns 225

Thomas A. Meyers/Both bulls and bears will welcome these five low-cost investment packages designed to help you analyze the market and track your investments.

HARDWARE Computing on the Run 188

Roland Racko/The Visual Commuter Computer performs its tasks simply and competently, but it's not as PC-compatible as its marketers would like to have you believe.

PC-870: Fast Anchor for Your Network 233

Winn L. Rosch/The PC-870 is a heavy-weight hard disk that uses a special memory cache to offer your network high performance and speed.

WORD PROCESSING Put Your Text in Top Form 209

Dean Hannotte/Most of the word processors currently available include some text-formatting capabilities. But for highly complex documents with indexes, footnotes, and the like, you may need one of the four sophisticated text formatters reviewed here.





PRO COLUMNS

PROGRAMMING

Copying Files Selectively 239

Steve Holzner/A short utility called Move helps you avoid the tedium of keying in filenames to create backup files.

EDUCATION

Testing the Testmakers 263

Jordan Rosenberg/Testmaking programs currently on the market barely make the grade. In particular, many are limited by their deficient menu systems and poor documentation.

MEDICINE

Putting the PC Before the Cart 265

Thomas Droege/The computerized case cart system that is in use at Duke University ensures that the proper surgical tools are supplied for each and every procedure.

LAW

Computer Education: Legal Aid 269

Bob Rosensweet/Although attorneys weren't the first to jump on the computer bandwagon, now they're doing justice to the world of micros by learning about computers in professional organizations and in law schools.

BUSINESS

Print Sideways 273

Mark Kass/Sideways rotates the printed output from your spreadsheet programs 90 degrees, allowing an almost unlimited number of columns on a continuous line and eliminating the need to cut and paste your spreadsheets.

WRITING

Typesetting for Writers 329

Terry Ullick/By learning the ins and outs of typesetting, writers can bypass the manuscript stage and communicate electronically with publishers and typesetters.

WHAT'S INSIDE

A behind the scenes glimpse at the making of this issue of *PC Magazine*.

PC NEWS

Fifteen pages of up-to-the-minute reports, interviews, minireviews, and useful tips, along with entertaining tales, fables, and juicy scoops from the computer community.

- Featuring three new columns: Down Time by Winn L. Rosch, Parity Check by Stephen Manes, and PC Update by Tom Baggett.

- And more: Phil Wiswell and Martin Porter are back from Winter CES in Las Vegas with an analysis of the show and reports on what's new in hardware and software for IBM Personal Computers.

- Late-breaking news covers the war against software pirates led by the industry captains of ADAPSO, the Association of Data Processing Service Organizations.

FROM THE EDITOR'S SCREEN

The Interactive Reader 83

Bill Machrone/PC Magazine's new Interactive Reader System will give you direct, on-line access to all the program listings printed in the magazine since the beginning of the year. To create another forum in which you can talk back, we also plan to cohost a series of teleconferencing seminars throughout 1985 and publish the results.

LETTERS TO PC

Our readers respond.

THE NORTON CHRONICLES

Writing Programs for TopView 105

Peter Norton/The TopView windowing system tries hard to accommodate every program. Here's how you can modify your programs to work with TopView.

DEPARTMENTS

USER-TO-USER

Paul Somerson/PC owners share their tips and short programs that may be just the answer to your question about software or your PC.

PC TUTOR

Mark Zachmann/Turn here for answers to readers' technical and nontechnical questions about personal computing.

SPREADSHEET CLINIC

David Hoffman/Helpful hints and tricks to make using spreadsheets easier.

CLUB NEWS

Jane Mintzer/Listings of dozens of PC user groups.

NEW ON THE MARKET

David Obregon/The latest in hardware, software, accessories, publications, and services for your PC.

PC BLUEBOOK

A quick reference guide.

PC:MART

Product listings.

PRODUCT INDEX

Index of products.

INDEX TO ADVERTISERS

Index of advertisers.

BOOK REVIEW

Apple to ZDOS: Where to Find It.

Howard Kartin/Two new directories list more software, hardware, peripherals, and consultants.

COMING UP

PC Tech Journal.

PC Magazine.

Cover Photograph: Dennis Kitchen



And you thought we only ran 1-2-3.

Why have we sold over 100,000 Hercules™ Graphics Cards? One reason is because we give the standard version of 1-2-3™ the highest resolution possible on an IBM® PC or AT.*

Now we've brought the same high resolution to Symphony™ and Framework™, giving them sharper, flicker-free text and graphics.

It took software support for Hercules to become the best selling graphics card for the IBM Monochrome Display. Support from dozens of companies like Lotus,™ Ashton-Tate,™ and Microsoft,™ who wrote programs to run on the Hercules Graphics Card.

Why did they support Hercules? Simple. The Hercules Graphics Card's resolution of 720 × 348 is twice IBM's (640 × 200)*. A parallel printer port is standard — not an extra cost option. And we're so confident of the reliability of our graphics cards that we back every one with a two year warranty.

Call 800 255-5550 Ext 400 for the name of the Hercules dealer nearest you and we'll rush you our free info kit.



Hercules.
We're strong on graphics.

Address: Hercules, 2550 Ninth St., Berkeley, CA 94710 Phone: 415 540-6000 Telex: 754083. Trademarks/Owners: Hercules/Hercules Computer Technology; Lotus, 1-2-3, Symphony/Lotus Development; Framework, Ashton-Tate/Ashton-Tate; IBM, AT/IBM; Microsoft/Microsoft. *The IBM Color/Graphics Monitor Adapter.
CIRCLE 145 ON READER SERVICE CARD

We Set the Standard in Prices!

For IBM PC Add-On Products.

Superior quality products and services at lowest prices.

Look at what we have to offer, before you buy any add-on products for your IBM PC.



QIC-01. 10 MB internal hard disk subsystem at ~~\$795~~ - *too low to quote*

Our half-height 10 MB hard disk comes complete with controller, cables, Microscience drive and easy to follow instructions. It fits inside one of your floppy slots and draws same amount of current as a floppy. It is compatible with DOS 2.0, 2.1 and 3.0 without any patches. In fact, you can simply boot up from the hard disk. This is the same hard disk system you see advertised for hundreds of dollars more.

20 MB half-height internal hard disk **\$1095.**

20 MB drive for PC AT **\$895.**

40 MB full height with controller **\$1995.**

QIC-02. Streaming cassette tape back-up subsystem. \$777.

Now, you can back-up your 20 MB of hard disk in less than 10 minutes. This half-height cassette tape system fits inside your IBM PC and is very easy to install. It comes with a controller card, cables, cassette drive, one cassette tape and all necessary software. You can perform image back-up as well as file by file back-up and restore.

20-60 MB Cartridge tape subsystem **\$995.**

QIC-03. 300/1200 baud internal modem. \$275.

This auto dial/auto answer plug-in modem lets your PC talk to the world with reliable and easy operation. It is FCC certified, Bell 103/212 compatible as well as fully Hayes compatible. You can run all the popular communication programs as well as our superior QIC Com software program.

Our QIC-Com software program provides phone list management as well as powerful file transfer capabilities. You can even run any DOS programs such as WordStar concurrently without having to disconnect your line. Priced at \$45.00, it is an offer you don't want to miss.

QIC-04. Half-height floppy drive. \$129.

This half-height floppy is the quietest drive on the market. It draws the least amount of current and is compatible with your PC's floppy controller card. It's double sided, double density.

QIC-05. Five function card. \$199. (64 K RAM Set \$33.00).

Our five function card includes memory expansion from 0 to 384K, one serial port, one parallel port, one game port and one battery back-up clock/calendar. RAM disk, print spooler and clock utilities are also included.

Expansion box with 10 MB hard disk **\$1495.**

Expansion box with 20 MB hard disk **\$1995.**

One Year Guarantee

No Risk. All our products are guaranteed for one year. And remember, if for any reason, you are not completely satisfied within 30 days, you can return it for a full refund. Check out our competition and find out which is best. We know better.

**CALL US TODAY AT
408-942-8086**

QIC RESEARCH
INCORPORATED
528 Valley Way
Milpitas, CA 95035

FOR THE IBM® PC, IBM® XT, COMPAQ™,
CORONA™, CORONA™ PORTABLE, LEADING EDGE® EAGLE PC®, TAVA™



10 Mbyte Hard Disk System

~~\$895~~ \$695



Kamerman Labs combines the speed and storage capacity of hard disk technology with prices you can't afford to pass up.

A dramatic leap in performance for your personal computer.

Even the smallest Kamerman Labs hard disk unit gives you 30 times the storage capacity of a typical floppy disk. Sophisticated business and professional data storage requirements can now be handled with ease.

Better yet, you can access data up to 10 times faster than with floppies. Spend more time working and less time waiting.

And it's easy to use. Kamerman Labs lets you boot directly off the hard disk, just like the IBM XT.

A complete backup solution.

Backup of hard disk data is a critical requirement in many microcomputer applications, so Kamerman Labs offers several reliable and cost-effective backup devices that are fully compatible with our hard disk units.

Lower prices than ever.

Because you deal directly with Kamerman Labs, we offer you remarkably low prices. Finally, you can realize the full benefits of hard disk technology without the excessive costs.

Tested and formatted.

All Kamerman Labs systems have been thoroughly tested and formatted before delivery.

Full warranty and technical support.

Kamerman Labs backs all its products with a full one-year warranty on both parts and labor. Plus you get prompt technical support through a toll-free hotline number.

To order, call toll-free 800-522-2237.

In Oregon, Hawaii and Alaska call 503-626-6877.

IBM is a registered trademark of International Business Machines Corp.
Compaq is a trademark of Compaq Computer Corp.
Corona is a trademark of Corona Data Systems.

Leading Edge is a registered trademark of Leading Edge Products, Inc.
Eagle is a registered trademark of Eagle Computers.
Tava is a trademark of Tava Corporation.

All Kamerman Labs Units come in either internal or external configurations.

**Kamerman
Labs**

CIRCLE 317 ON READER SERVICE CARD

8054 S.W. Nimbus, Bldg. 6, Beaverton, Or 97005
Phone 503-626-6877

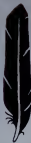
Of course you can't do seven things at once, but your computer can



...with WindowMaster™

Now your computer can handle up to seven applications at once with Window Master — the exciting, new multitasking, windowing system. Balance your books, perform spread sheet calculations, print your color graphics, and input information into your data base...simultaneously. WindowMaster integrates all the popular industry packages and allows them to exchange data. Let your computer work for you.

- Multitasking — runs MS™DOS and CP/M-86® applications concurrently
- Lets you use the software of your choice — Lotus 1-2-3™, WordStar™, dBASE™...
- Includes full business graphics — color or B/W bar, line, and pie charts
- Simple interwindow data transfer
- User-definable application menus
- Programmable function keys
- User-created "scripts" perform repetitive or complicated tasks.



Indian Ridge Enterprises
Incorporated

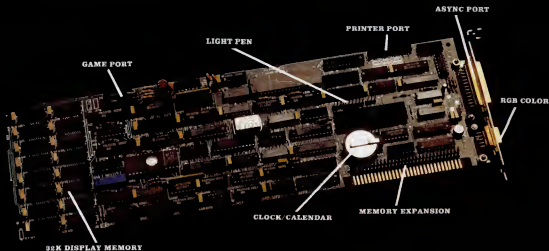
Retail
415/ **268-1488**

OEM
415/ **268-1631**

508 Second Street
Jack London Square
Oakland, CA 94607

WindowMaster is a TM of Indian Ridge Enterprises, Inc. Lotus 1-2-3 is a registered TM of Lotus Development Corp. WordStar is a registered TM of MicroPro International Corp. dBASE III is a TM of Ashton-Tate. CP/M is a registered TM of Digital Research, Inc. MS-DOS is a registered TM of Microsoft Corp. IBM PC is a registered trademark of International Business Machines, Inc.

The **RAINBOW** Color Graphics/Multifunction Board...



The Only Board your IBM® PC, XT or AT may ever need.

The **RAINBOW** Color Graphics/Multifunction Board gives you all these functions in just one board.

- Fully IBM Compatible RGB Color Graphics Interface
- IBM Compatible Parallel Printer Interface
- Battery Backed-Up Clock/Calendar
- IBM Compatible Asynchronous Interface
- High Resolution Light Pen Interface
- IBM Compatible Game Interface
- Option to Piggy-Back up to 384K of System Memory

Call (214) 247-2552 for additional information and the name of your nearest **RAINBOW** Color Graphics/Multifunction Board dealer. Find out how you can get a **RAINBOW** of functions on just one board.

PC
Products Inc.
QUALITY EXPANSION BOARDS FOR PERSONAL COMPUTERS

IBM, IBM PC, XT, AND AT ARE ALL REGISTERED TRADEMARKS OF IBM CORPORATION

2510 Southwell, Suite 103, Dallas, Texas 75229

CIRCLE 533 ON READER SERVICE CARD

AST PCnet II.TM

A SIMPLE PLUG FOR SHARING COMPUTER RESOURCES.

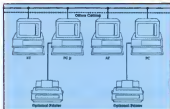


Now that you've invested in several IBM® PCs for your office, you're looking for ways to use your PCs, printers and mass storage devices even more effectively. Ways to further reduce duplication of work. And ways to share the information and programs you've gathered among several users.

AST has the simple solution. AST-PCnet II lets you link your PCs together to share information and equipment. And communicate results between PCs in a ready-to-use format.

It's easy. You install a card into each computer, then connect them with simple, plug-in wires. Over 10,000 PCs are already using AST-PCnet II to boost productivity, enhance communications and save money.

And with AST's complete hardware/software solution, there's nothing else to buy—our economical package assures major installation savings over networks using cumbersome coax cable.



AST-PCnet II's unique software lets you work with familiar PC-DOS commands including version 3.0. It also handles popular programs and allows you to share data base, spreadsheet and word processor files including Lotus 1-2-3® and Symphony™, dBase II and III™, Framework™ and WordStar™.

It's a great long term buy too. It's the only network linking the entire PC family—PC, XT, AT and PCjr.

Find out more today. Ask your AST dealer for a demonstration or call our Customer

Information Center (714) 863-1333 ext. 5249 for the location of your nearest dealer. AST Research Inc., 2121 Alton Avenue, Irvine, CA 92714, TWX 753699ASTR UR.



AST

RESEARCH INC.

IBM, PC, XT, AT, PCjr and PC-DOS trademarks of International Business Machines Corporation. Lotus 1-2-3 and Symphony trademarks of Lotus Development Corporation. dBase II, dBase III, and Framework trademarks of Ashton-Tate. WordStar trademarks of MicroPro International Corporation. AST-PCnet II trademark of AST Research Inc.

CIRCLE 105 ON READER SERVICE CARD

You can buy a less expensive diskette and not save a thing.

One can understand the temptation to buy a less expensive diskette.

Rather than a Dysan® diskette.

After all, the less expensive diskette is probably almost as good. And should you run into a bad one, well, it didn't cost that much, anyway.

Right? Not quite.

You see, a less expensive diskette is by definition less diskette. And the few pennies you save are worth a great deal less than what you have to lose.

Namely, your data.

That's why it makes more sense to spend a bit more for a Dysan diskette.

Every Dysan diskette you buy will record and retain all your data all the time.

You can be sure of that because every Dysan diskette is certified 100 percent error free and backed by our lifetime warranty.*

So next time you're tempted to buy a less expensive diskette, ask yourself this question.

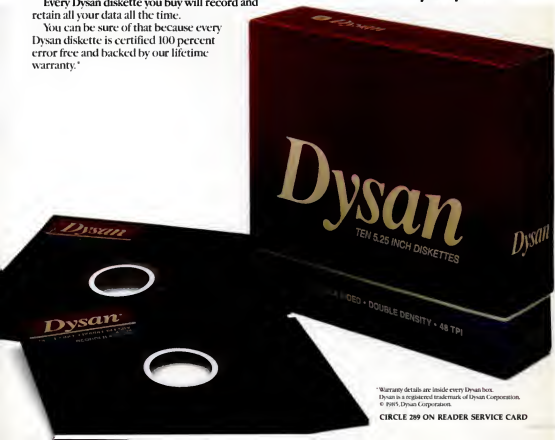
Can you really afford it?

For the name of the Dysan dealer nearest you, call toll free (800) 551-9000.

Dysan Corporation, 5201 Patrick Henry Drive, P.O. Box 58053, Santa Clara, CA 95050.

Dysan

**Somebody has to be better
than everybody else.**



*Warranty details are inside every Dysan box.

Dysan is a registered trademark of Dysan Corporation.
© 1985, Dysan Corporation.

CIRCLE 289 ON READER SERVICE CARD



What's Inside

Armchair analysts we aren't, but practical sorts we are. That's why we have taken a concrete, straightforward approach to what could be a modern nightmare—the breakdown of your PC.

Most people I know have at least one minor phobia. A visit to the dentist seems to head that list, followed closely by handling snakes and insects, and riding on the New York City subway system. These aren't the debilitating kind of fears that necessitate a weekly visit to an analyst; rather they're the type most people learn to live with.

As for me, I have an unusual tolerance for dentists (having been told by my childhood practitioner that "pain is good for the soul"), find snakes fascinating, kill cockroaches with grim satisfaction, and regard the subway as one of life's bearable evils. However, there is one facet of modern life that fills my soul with terror and sets my well-filled teeth chattering.

Repair shops.

Just thinking about walking into one of those places makes me wish that I lived in a simpler time when such torments were unknown and unnecessary—like the Stone Age. And because I own a personal computer, no matter how convenient and necessary it is to my profession, it just increases my sense of dread. It also makes me remember the time I tried to boot up my machine just as a fuse blew in my apartment. There I sat in front of the blank screen while the following scenario flashed before my eyes.



The Scene

A small, darkened repair shop cluttered with the bits and pieces of left-over computers. A man dressed in a pair of greasy overalls sits, feet up on the desk, smoking a 10-cent cigar.

A worried customer enters, grunting under the weight of an IBM PC central processing unit.

Customer: Uh . . . hello?

Repairman: (Sensing a victim) Yeah? Whaddaya want?

Customer: Well, I own an IBM PC with a double-disk drive, and the machine won't boot up.

Repairman: (Thinks this over for a few minutes, then heaves himself wearily out of his chair.) Probably a connector on the motherboard's gone sour. Put it here. (Points to counter.)

The customer heaves the computer onto the counter. The repairman glares at it for a moment, then takes off the cover, tossing it into a pile of identical covers in the corner.

Repairman: Yeah, just as I thought. I'm gonna have to keep it in the shop for a couple weeks and work over that motherboard.

Customer: Oh . . . How much is this going to run me?

Repairman: I'd say a good five, six hundred bucks, minimum.

Customer: (Dismayed.) Could you give me a written estimate?

Repairman: What's the matter? Don't ya trust me?

Customer: Sure, sure, of course I do. It's just that. . .

Repairman: Okay, then. (Drops the computer behind his desk and scribbles something indecipherable on a slip of paper.) Here's your receipt. We'll call ya in a couple of weeks. (He settles himself back onto his chair.)

Customer: Um, okay, fine. Goodbye. (Finding himself ignored by the repair-

man, he leaves the shop with the uneasy feeling that he just kissed his PC good-bye.)

Of course, I know that computer stores

and repair services don't really operate that way. They're a lot cleaner, for one thing, and for another, the people who work there dress in suits rather than

stained uniforms. But I can't help feeling that somewhere inside every computer store staff member, there lies an old-fashioned repair shop dictator just waiting to spring out the moment he gets the chance.

The Relief

So I was delighted when I found that this issue of *PC* would feature articles on how to maintain and/or repair your microcomputer. In fact, according to *PC* freelancers Hank Beechhold and Gene Williams, if you can operate a microcomputer, you can diagnose it and probably even fix it. Beechhold, who has recently written not one but two books about this subject, has contributed a highly detailed article on maintaining your disk drives. Williams tells how you can troubleshoot your boards and peripherals. Dorothea Atwater, a woman after my own heart, has written an article entitled "Keeping the Repairman Away," and Wendy McKibbin has investigated the ways repair contracts may help relieve the financial burden of having your PC fixed.

Beyond Repair

Meanwhile, just so that you won't think that *PC* is pandering to its editors' neuroses, we have a special software review by Jan Young on SLAM, a business simulation language, in which he compares it to writing simulation programs in more general-purpose languages. Also included is the first installment of a Spreadsheet Clinic edited by David Hoffman and a review by Thomas Mcyers of low-cost investment software.

You know, getting a computer fixed may not be such an ordeal after all. Armed with a positive attitude and a little useful knowledge, nobody really has to fear repair people.

(By the way, if the staff at my local computer store is reading this, I wasn't really writing about *your* repair services. Really! Cross my heart! You believe me, don't you . . . ?)

s b t
CORPORATION

Accounting Software Library
in dBASE II®/dBASE III®

May The Source Be With You

The Secret's Out

Most software companies keep their source code top secret. (The source code is the set of commands that make a computer perform a given task.) But SBT doesn't keep any secrets—instead we freely give away our dBASE Accounting Source Code so you get the control and flexibility that's crucial to a well run business.

When there are no secrets, you can add a special part number system or change a report at will—the possibilities are endless. That's why SBT Accounting Software can change and grow with your business needs.

Integrated or Stand Alone

Start with the modules you need now, and add the others later. Best of all, SBT Software works on all computers that can run dBASE II or dBASE III.

.dOrder	Sales Order Processing	\$195
.dInvoice	Billing/Inventory Control	\$195
.dStatement	Accounts Receivable	\$ 95
.dPurchase	Purchase Order	\$195
.dPayable	Accounts Payable	\$295
.dPayroll	Payroll/Labor	\$395
.dLedger	General Ledger/Finance	\$395
.dAssets	Asset/Depreciation	\$195
.dProject	Project/Job Accounting	\$345

Demonstration disks available.

Call SBT at 406-980-8880 for more information.

s b t
CORPORATION

SBT Corporation
1140 Mountain View-Alviso Rd.
Sunnyvale, California 94089

*dBASE II and dBASE III are registered trademarks of Ashton-Tate.

Buy our 384K board for your AT&T PC. You'll thank us a bundle.



Buy our THESYS FASTCARD™ Memory board for AT&T* at the regular price of \$595 and get the \$149 Grafix Partner and our \$60.00 FASTWARE™ 3.0 High Performance software absolutely free.

FASTCARD.

Our FASTCARD super memory board uses patented 256K DRAM chip technology to expand memory to 640K. No software or hardware alterations are required.

FASTWARE.

Our 3.0 software automatically increases the speed of disk access. Provides RAM cache, print buffering and cuts hard disk-to-floppy backup time in half. No hardware or software alterations required.

GRAFIX PARTNER.

Best-selling Grafix Partner color software lets you customize Lotus

and other graphic images to your needs. Works as standalone software or co-resides with other programs.

Now that's a bundle. Offer good till February 28, 1985. For information or credit card orders, call toll-free 1-800-621-8282. Or write THESYS, 7345 East Acoma Drive, Scottsdale, Arizona 85260, 1-602-991-7356. Dealer inquiries invited. Shipping costs extra.

*For use with AT&T 6300 PC only.



Thanks for the Memory



THESYS
Memory Products Corporation

**PC BRAND'S CRAFTSMANTM
TOOLS FOR "C" SHOPS**

PRECISION SOFTWARE FOR PROGRAMMERS

SUPPORT DIRECT FROM LATTICE

Products with codes beginning "L" are all fresh from Lattice Inc., the premier software developer serving the C professional marketplace. PC BRAND has made special arrangements for Lattice to provide telephone support for these products directly.

Take advantage of this unusual opportunity. Buy from PC BRAND, and you get to talk to the experts themselves!

30-DAY MONEY-BACK GUARANTEE

It gets better. We will return the purchase price of any "L" or "N" coded product offered in this space if you decide it fails to meet your needs. You read that correctly. We want you to be completely satisfied with your purchase. Go through the manuals, try out the products themselves, and make a thoroughly informed decision whether they are right for you.

There are rules: We can make this offer in the U.S. and Canada only. For you to be eligible for refund or credit, we must receive your returned product within 30 days of its shipment. Everything but the packing must be in our judgment be in 100% resalable condition.

(a) Subject to terms and conditions of sale. (b) Not shipping and handling.

CODE SIFTER

Find the Hot Spots in Your Program

Fast is never fast enough; only miracles need apply. That's what's expected in today's marketplace, so our Code Sifter is an important tool to add to your workbench.

Code Sifter finds the trouble spots in your program. On its own, it will divide a COM or EXE file of any size into thirty-two equal partitions. Alternatively, you can specify the partition boundaries with addresses, or with symbols if your linker has produced a symbol map. Then tell Sifter to run your program. It samples your object file at precisely defined intervals and counts how many times it finds the instruction pointer on each partition. Job done, it reports the number and percentage of hits in each partition.

You are in for some surprises when you discover just how unbalanced the activity is likely to be, and that's why Code Sifter is so valuable. It profiles just where you can best spend time optimizing your code, or even converting to assembler subroutines.

Code Sifter has a number of monitoring options. You can tell it to do any combination of your program, DOS, and BIOS in its analysis. You can specify the sampling rate. Most important, you can tell Code Sifter the number of times to run a program, and between each run discard the less active ranges and re-partition the hot spots, so that you zoom

in ever tighter on small areas of code. Right down to the last byte! Literally. Try it on the sample program that comes with your disk.

Code Sifter. It will give you the racer's edge.

Product Code: N3100#

Price: \$119

SOURCE CODE FOR SALE

Designer Originals For Your Special Needs

"One size fits all" turns away disappointed customers. When you cannot shoehorn your application into out-of-the-box software, we have the solution. For each of these products only, PC Brand now licenses source code, provided you buy (or have already bought) from us the object code counterpart. Take it in, let it out, and make it fit snugly to your needs. And, if you are new to C, you will learn a lot appreciating this fully documented code from top designers.

Lattice C Compiler Library
for MS-DOS/PC-DOS
for Z80
C-Food Smorgasbord Library
Curses Library
db-C Library
for dBase II
for dBase III
CVUE Screen Editor
Text Toolbox #1

Product Code:
L9100#
L9102#
L9200#
L9500#
L9011#
L9111#
L9240#
L9220#

Price:
\$500
800
500
125
250
250
350
120

Product Code: L2100#

Price: \$195

LMK

A Unix-like "Make" Makes Light of System Building

USED COMPILERS

WELCOME

Trade In for the Latest Model Lattice C

Has your compiler run out of gas? Has your model been discontinued? Is it falling behind for lack of new parts?

Even if yours is in good shape, you have surely noticed there are more options and accessories provided to run with the Lattice C Compiler than any other. Don't do without these additives any longer. It's time for new license plates. Trade in your original disks and manual of any of the compilers below and we'll send you Lattice's most up-to-date model, the full bore 2.14 (at press time).

From then on you will be adopted by Lattice for full, direct support by their technical specialists.

Product Code LU150: Price:
Microsoft MS-DOS/PC-DOS C \$150
Product Code LU200:
Computer Innovations C86 \$200
Mant Artex C86 \$200
Mark Williams C \$200
Ward C \$200
Digital Research C \$200
Whitesmith's C \$200

If you have ever built a complex system, you know the time loss and tedium of recompiling, rebuilding libraries and relinking modules because a snip or two of code has changed. Batch files are no answer. You need batches of them to avoid redoing everything indiscriminately.

Instead, imagine making a change snip in a system, and simply telling Lattice's LMK to take over. No further thinking or keystrokes. LMK will rebuild your final product, however involved and complex, by doing just what is needed and no more.

How? You write a command file which expresses bottom to top all the elements comprising your system and all its dependencies: what gets compiled to make what object file using what options; what is built into libraries; what is linked into the final EXE file. Through the life of your system, LMK keeps track of the last time every action was performed. Run LMK and, tracking each branch, it looks only for elements which changed later than a dependent element further along the branch, using date and time information found in the file directory. Any source file newer than its object file, for example. Only those elements and their dependents are re-made. All other instructions are bypassed.

The command file uses a simple, readable syntax — "prog.obj: prog.c \$HDRVS"; for example, says what source file this object file depends on, and fills the previously defined macro HDRVS into the expression, which here might be a list of files with hardware drivers, or in another case your preferred string of compiler options.

LMK does not care what programming language you use, it's not just for C. For that matter, LMK can apply to more than programming. It can be used for any set of tasks which can be accomplished through commands issued to the operating system. Try it for repeated re-assembly of lengthy documentation, or for selective re-consolidation of spreadsheets so that only dependents of changed supporting schedules get recalculated.

Wherever your imagination leads you, LMK will find the shortest path to get the job done. Minimum time, minimum effort software.

TERMS AND CONDITIONS OF SALE

Licenses: Each price is for a license to use a product on a single computer and does not constitute product ownership. Ask about availability of other terms for multiple machine use at a single site. Products coded "H" may be used to create programs for distribution without royalty payments or additional licenses, provided said programs do not substantially reiterate the products themselves. Compatibility: PC BRAND's standard products are designed to operate with the IBM PC, PC XT or AT under PC-DOS and require no more than 128K of RAM unless indicated.

Return of Non-Licensed Products: Acceptance for refund or credit only by price

authorization subject to a restocking charge. Software diskettes are delivered in sealed envelopes and are unreturnable if seal is broken. Defective products will be replaced in whole or part.

Payment: We honor MasterCard & Visa pre-purchase, wire funds, checks in advance, and COD for cash or certified check 60 day. Purchase orders accepted from corporations and institutions at our discretion. 2% per month added to balances unpaid after 30 days.

Shipping & Handling: U.S. UPS Surface: 1st product \$8, each add \$3.00. UPS 2nd Day Air: 1st product \$10, each add \$4.50. UPS Next Day Air or Federal Express: 1st product \$18, each add \$6. International: Charges dependent on destination and method of shipment.


We're as Near as Your Telephone. Call us at...

800-PC BRAND

That's (800) 722-7263. In NY State call (212) 410-4001.

PC Brand, 345 E. 86th St., New York, N.Y. 10028

CIRCLE 141 ON READER SERVICE CARD



**More power
to the
people that count...**

the all new Touchstone 2™

Entering numeric data into your PC is a very serious, very tedious business. Since a lot of this work is done by your fingers, doesn't it make sense to use a numeric keypad that was designed for the human hand?

Touchstone 2™ is a professional productivity tool for people who enter and revise numeric data...in spreadsheets, accounting systems, inventory control and similar applications.

Total one-hand control

The Touchstone 2 puts 53 key commands under the complete control of one hand. All of the most frequently used keys are accessible with a single touch, while a local shift key provides handy access to PgUp/PgDn, Tab Left/Right, ten standard F-keys, and other special control keys that you may need on an occasional basis.

Dedicated cursor and page controls

The cursor controls are always available right next to the number keys, and, at the touch of the local shift, they become page up and down, and tab left and right keys.

All your favorite keys in one place

Unshifted percent and brackets for speedy entry of compound math; space, backspace, home, end, alt,

ctrl, prt sc, and more, plus all ten standard function keys.

Even a place for your macros

To keep it compact, we couldn't include the whole alphabet, but Touchstone 2 does have A, B, and C to use as handy and easily-remembered hooks for user-defined keyboard macros.

Enter numbers twice as fast

Touchstone 2 data entry takes about 40% of the hand movement usually required with the standard PC keyboard. Even more important, it eliminates the need to look for each digit as it is entered.

Superior ergonomics

Low-profile design meets DIN specs; reduces fatigue. Number pad has slide-mounted Enter and math keys that conform to the traditional calculator layout. Heavy-duty case is easily lap-portable, but won't slide around. Standard locating lip on 5 key helps keep fingers where they belong.

Reliable performance

The Touchstone 2 has its own unique microprocessor with 16-character buffer and patented Entry Error Elimination system. Next-key rollover feature ensures positive entry of every keystroke, even when a previous key has not been fully released.

Full-travel keyswitches are rated for 50 million cycles; provide quiet yet positive feedback. Contacts are covered by a protective membrane to guard against dirt, dust and accidental spills.

Touchstone 2: Built so well it carries a full one-year warranty and a 15-day unconditional guarantee.

A plug-in workmate for the IBM PC and many compatibles

Split cable and standard connectors allow you to use the Touchstone 2 alone or side-by-side with the main keyboard of your IBM PC or XT and many compatibles. Additional models available soon will be compatible with the IBM PC-AT, PC JR., and Compaq.

An investment in greater efficiency

The all-new Touchstone 2 takes the tedium out of number-crunching; lets you concentrate on more challenging work. The time you'll save will quickly return your small investment of \$199.95. Order by mail or phone for immediate shipment, or ask for it at leading computer and software stores.

**CALL TOLL FREE
1-800-828-6968**

In New York, dial 1-800-462-4891
International Calls 1-714-236-0358



**TOUCHSTONE
TECHNOLOGY INC.**

955 Buffalo Road • P.O. Box 24954
Rochester, New York 14624

CIRCLE 507 ON READER SERVICE CARD

To order by mail: Specify PC model number and payment by C.O.D., Visa, MasterCard, or check enclosed. Credit card customers include complete card number and expiration date. Add \$3.00 for shipping (\$4.50 for Canada). New York state residents add 7% sales tax. Dealer inquiries welcome.

Borland's SideKick™ 1984 Product of the Year*

The Critics' Choice What more can we say?

"SideKick™" stands in the shadows behind whatever program you are using, ready to jump forward when you need it. The program's various functions use windows that overlay the display you are working with and restore the screen when you are through. The program contains a respectable word processor for note taking, a dialer that your smart modem can use with your phone list, a calculator for hexadecimal/binary/decimal arithmetic, an appointment calendar and an ASCII table for programmers . . . **SideKick is a time-saving, work-saving, frustration-saving bargain.** Having a programmer's calculator, an appointment calendar, and a notepad at your beck and call, no matter what program is running, is the first big step to making the paper and pencil obsolete."

—Dan Robinson
of InfoWorld

And he's not the only one talking:

Charles Petzold, PC Magazine: "In a simple, beautiful implementation of WordStar™'s block copy commands, SideKick can transport all or any part of the display screen (even an area overlaid by the notepad display) to the notepad."

Jerry Pournelle, BYTE: "If you use a PC, get SideKick. You'll soon become dependent on it."

Garry Ray, PC Week: "SideKick deserves a place in every PC"



Here's SideKick in action with Lotus® 1-2-3 running underneath. Data has been imported from Lotus to SideKick's notepad, shown in the lower portion of the screen. The notepad is a full-screen editor that lets you import and export data; it utilizes WordStar commands to let you time- and date-stamp notes and save them to disk. The SideKick calculator, shown at the upper right, offers memory capability, nested parentheses, and the ability to convert decimal to hexadecimal or binary. It even lets you transfer resulting figures to your underlying application.



The telephone autodialer/directory places calls for you via your Hayes™-compatible modem and locates numbers from one of the program's several directories. Here the dialer is running on top of WordStar.

The calendar can record appointments, records and notes—yours or those of the entire department—up to the year 2099. Here the dialer is running on top of Lotus.



The ASCII reference table, important enough to be in every manual, is now at your fingertips at all times. Here the screen shows all windows, including an ASCII table running over Lotus.

BORLAND INTERNATIONAL

Software's Newest Direction
4113 Scotts Valley Drive
Scotts Valley, California 95066
TELEX 172373

*Selected by InfoWorld as the most significant software product of the year

CIRCLE 149 ON READER SERVICE CARD

SIDEKICK

NOT COPY-PROTECTED

Available at better dealers nationwide. Call (800) 556-2283 for the dealer nearest you. To order by Credit Card call (800) 255-8008, CA (800) 742-1133

Yes, I want the Best.
Please send me SideKick!

SideKick Copy Protected
Quantity: _____ at \$54.95

SideKick Unprotected
Quantity: _____ at \$84.95*

Amount (CA 6% tax) _____

Payment: ☐ VISA ☐ MC ☐ Bank/Draft ☐ Check

Credit Card Exp. Date _____

Name on Card _____

Card # _____

Name _____

Shipping Address _____

City _____ Zip _____

State _____ Telephone _____

COD's and Purchase Orders WILL NOT be accepted by Borland. California residents add 6% sales tax. Outside USA, add \$10 and make payment by bank draft, payable in US dollars drawn on a US bank.

Borland is a registered trademark of International Business Machines Corp. Lotus is a trademark of Lotus Development Corp. SideKick is a trademark of Borland International, Inc. WordStar is a registered trademark of MicroPro International Corp.

Only from Topaz...

Powermaker[®] Micro UPS

**Uninterruptible, computer-grade power
—at half the cost**



It's in a class by itself.

For about half the cost of other Uninterruptible Power Systems, you can now get the same degree of protection with our Powermaker Micro UPS. This remarkable new system eliminates computer problems caused by blackouts, brownouts, voltage sags and power-line noise.

Providing up to 75 minutes of continuous computer-grade power, our Powermaker Micro UPS is compatible with microcomputers and PC's. It's fully automatic, maintenance-free, portable and compact. It fits neatly alongside or under your desk or workstation. And because you can't always tell when you've lost primary power, our little UPS even features an audible line-loss alarm.

But best of all is the price. The Powermaker Micro UPS is priced right and is ready for immediate shipment. Find out more about our Powermaker Micro UPS. Call us at (619) 279-0831, or contact your local Square D distributor.

TOPAZ[®]
Excellence in Computer Power

SQUARE D COMPANY

Borland does it again: SuperKey \$69.95*

Sure, ProKey™ is a nice little program. But when the people who brought you Turbo Pascal™ and SideKick™ get serious about keyboard enhancers, you can expect the impossible . . . and we deliver.

SuperKey	
ProKey	
ALL FEATURES RESIDENT IN RAM AT ALL TIMES	NO
RESIDENT PULL-DOWN MACRO EDITOR	NO
RESIDENT FILE ENCRYPTION	YES
PROKEY COMPATIBILITY	NO
DISPLAY PROTECTION	NO
ABILITY TO IMPORT DATA FROM SCREEN	NO
PULL-DOWN MENU USER INTERFACE	NO
CONTEXT-SENSITIVE ON-LINE HELP SYSTEM	NO
DISPLAY-ONLY MACRO CREATION	NO
ENTRY AND FORMAT CONTROL IN DATA FIELDS	NO
COMMAND KEYS REDEFINABLE "ON THE FLY"	NO
PRICE	129 ⁹⁵



Total ProKey compatibility. Every ProKey Macro file may be used by SuperKey without change so that you may capitalize on all the previous time you've invested.

Now your PC can keep a secret! SuperKey includes a resident file encryption system that uses your password to encrypt and decrypt files, even while running other programs. Two different encryption modes are offered.

1. Direct overwrite encryption (which leaves the file size unchanged) for complete protection. At no point is a second file that could be reconstructed by an intruder generated. Without your secret password, no one will ever be able to type out your confidential letters again!

2. COM or EXE file encryption which allows you to encrypt a binary file into an ASCII file, transmit it through a phone line as a text file and turn it back again into an executable file on the target machine (only of course if your correspondent knows the secret password). Now, you will even be able to secretly exchange programs through Public Bulletin Board Systems or services such as CompuServe.

Totally memory resident at all times, gives SuperKey the ability to create, edit, save and even recall new or existing macro files anytime, even while running another program.

Pull down macro editor. Finally, a sensible way to create, edit, change and alter existing macro definitions. Even while using another application, a simple keystroke instantly opens a word-processor-like window where you're allowed to see, edit, delete, save and even attach names to an individual macro or file of macros, and much more.

Sorry ProKey™!

Superb software at reasonable prices! There is much more to SuperKey. Maybe the best reason to buy SuperKey is that it is a Borland International Product. Each one of our products is the best in its category. We only believe in absolutely superb software at reasonable prices!

An offer you can't refuse.

Whether you are a ProKey user or you've never used a keyboard enhancer before, your boat has come in; until June 1st 1985 you can get your copy of SuperKey at this special introductory price.

Get your PC a SuperKey today!

SuperKey is available now for your IBM PC, XT, AT, iC and truly compatible microcomputers.



Software's Newest Direction
4173 Scotts Valley Drive
Scotts Valley, California 95066
TEL EX 172373

IBM is a registered trademark of International Business Machine Corporation. ProKey is a trademark of Borland. SuperKey and SideKick are trademarks of Borland International, Inc.
CIRCLE 150 ON READER SERVICE CARD

SuperKey

NOT COPY-PROTECTED

Available at better dealers nationwide. Call (800) 556-2263 for the dealer nearest you. To order by Credit Card call (800) 255-8008, CA (800) 742-1133

Introductions Offer

\$69.95*

*This price includes shipping to all U.S. cities. All foreign orders add \$10 per product ordered.

YES! Please rush SuperKey to me.

Send me _____ copies.

Name _____

Shipping Address _____

City _____ State _____ Zip _____

Telephone _____

Amount (CA 6% tax) _____

Payment: ☐ VISA ☐ MC ☐ Bank Draft ☐ Check

Credit Card Exp. Date _____

Name on Card _____

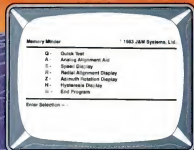
Card # _____

COD's and Purchase Orders WILL NOT be accepted by Borland. California residents add 6% sales tax. Outside USA add \$10 and make payment by bank draft, payable in US dollars drawn on a US bank.

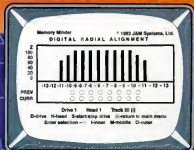
MEMORY MINDER

T.M.

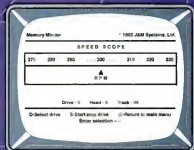
... A UNIQUE APPROACH TO DISK RELIABILITY!



Select any one of seven tests to perform preventive maintenance or to isolate problems. Simple, single-letter commands make MM easy to use! Use MM to align the head, or adjust the speed.



Use the MM Radial Alignment Test to check the head alignment of your drives. No need for an oscilloscope or other expensive test equipment!



Check the motor speed of your drives. Or, you can even use the Speed Test to adjust the drive speed. No need for any test equipment!



Use the Quick Test to quickly and automatically test five of the most important performance parameters of your drive. Monitor your drives for long term drift. Isolate problems quickly and automatically!

PROTECT YOUR DATA.

Now you can make sure your data is being recorded properly by the use of the revolutionary *Memory Minder*.

The Memory Minder from J & M Systems, tests your disk's performance and calibration without any additional equipment! It measures your disk's performance and displays it on your screen.

This is the most comprehensive disk diagnostic program available for your IBM microcomputer. You can even adjust drive alignment while watching the display!

Spot problems *before* they endanger your data! If you own a disk drive, you *need* the *Memory Minder*!

IBM

1 - 160K Drives

2 - 320K Drives (Also test 160K drives)

Price

\$79

\$99

Memory Minder also available for most IBM compatibles.

J & M SYSTEMS IS THE DRIVING FORCE!



J & M SYSTEMS, LTD.

15100-A CENTRAL SE
ALBUQUERQUE, NEW MEXICO 87123
505/292-4182

They said it couldn't be done. Borland Did It. Turbo Pascal 3.0

The industry standard

With more than 250,000 users worldwide Turbo Pascal is the industry's de facto standard. Turbo Pascal is praised by more engineers, hobbyists, students and professional programmers than any other development environment in the history of microcomputing. And yet, Turbo Pascal is simple and fun to use!

COMPILATION SPEED
EXECUTION SPEED
CODE SIZE
BUILT-IN INTERACTIVE EDITOR
ONE STEP COMPILE (NO LINKING NECESSARY)
COMPILER SIZE
TURTLE GRAPHICS
BCD OPTION
PRICE

MS PASCAL	TURBO 2.0	TURBO 3.0
206 sec	16 sec.	8 sec.
20 sec.	13 sec.	9 sec.
35K	12K	12K
NO	YES	YES
NO	YES	YES
300K+	35K	35K
NO	NO	YES
NO	NO	YES
NO	\$49.95	\$69.95
\$295.00		

The best just got better: Introducing Turbo Pascal 3.0

We just added a whole range of exciting new features to Turbo Pascal:

- First, the world's fastest Pascal compiler just got faster. Turbo Pascal 3.0 compiles twice as fast as Turbo Pascal 2.0! No kidding.
- Then, we totally rewrote the file I/O system, and we also now support I/O redirection.
- For the IBM PC versions, we've even added "turtle graphics" and full tree directory support.
- For all 16 Bit versions, we now offer two additional options: 8087 math coprocessor support for intensive calculations and Binary Coded Decimals (BCD) for business applications.
- And much much more.

The Critics' Choice

Jeff Dautermon, PC Magazine: "Language deal of the century... Turbo Pascal. It introduces a new programming environment and runs like magic."

Dave Garland, Popular Computing: "Most Pascal compilers barely fit on a disk, but Turbo Pascal packs an editor, compiler, linker, and run-time library into just 29K bytes of random-access memory."

Jerry Pourmelle, BYTE: "What I think the computer industry is headed for: well documented, standard, plenty of good features, and a reasonable price."

Portability

Turbo Pascal is available today for most computers running PC DOS, MS DOS, CP/M 80 or CP/M 86. A XENIX version of Turbo Pascal will soon be announced, and before the end of the year, Turbo Pascal will be running on most 68000 based microcomputers.

An Offer you Can't Refuse

Until June 1st, 1985, you can get Turbo Pascal 3.0 for only \$69.95. Turbo Pascal 3.0, equipped with either the BCD or 8087 options, is available for an additional \$39.95 or Turbo Pascal 3.0 with both options for only \$124.95. As a matter of fact, if you own a 16 bit computer and are serious about programming, you might as well get both options right away and save almost \$25.

Update policy

As always, our first commitment is to our customers. You built Borland and we will always honor your support.

So, to make your upgrade to the exciting new version of Turbo Pascal 3.0 easy, we will accept your original Turbo Pascal disk (in a bend-proof container) for a trade-in credit of \$39.95 and your Turbo 807 original disk for \$59.95. This trade-in credit may only be applied toward the purchase of Turbo Pascal 3.0 and its additional BCD and 8087 options (trade-in offer is only valid directly through Borland and until June 1st, 1985).

(*) Benchmark run on an IBM PC using MS Pascal version 3.2 and the DOS linear version 2.6. The 179 line program used is the "Gauss-Seidel" program out of Alan R. Miller's book: *Pascal programs for scientists and engineers* (Sybex, page 128) with a 3 dimensional non-singular matrix and a relative coefficient of 1.0.

NOT COPY-PROTECTED

TURBO PASCAL

Available at better dealers nationwide. Call (800) 556-2283 for the dealer nearest you. To order by Credit Card call (800) 255-8008, CA (800) 742-1133

YES! I want the Best
Please send _____

Quantity _____

Pascal 3.0 \$ 69.95 _____

Pascal w/8087 \$109.90 _____

Pascal w/BCD \$109.90 _____

Pascal w/8087 & BCD \$149.95 (SAVE \$24.95) _____

*These prices include shipping to all US cities. All foreign orders add \$10 per product ordered.

Trade-in Credit Claimed _____

Amount (CA 6% tax) _____

Payment VISA MC Bank/Drift Check _____

Credit Card Exp. Date _____

Name on Card _____

Card # _____

COO's and Purchase Orders WILL NOT be accepted by Borland. California residents: add 6% sales tax. Outside USA, add \$10 and make payment by bank draft, payable in US dollars drawn on a US bank.

Carefully Describe your Computer System

Model is _____ 8 bit _____ 16 bit _____ MS-DOS _____

I Use _____ PC DOS _____ CP/M 80 _____ CP/M 86 _____

My computer's name/model is _____

The disk size I use is _____

☐ 5 1/4" ☐ 5" ☐ 3 1/2"

Name _____

Shipping Address _____

City _____ State _____ Zip _____

Telephone _____

BORLAND
INTERNATIONAL

Software's Newest Direction
4112 Scotts Valley Drive
Scotts Valley, California 95066
TELEX 172373

Turbo Pascal is a registered trademark of Borland International, Inc.

CIRCLE 147 ON READER SERVICE CARD



International Connections

With the industry's most popular data communications program, the world is at your command.

An import/export office in New Jersey can instantly check the London market for current dollar exchange rates ... send Hong Kong an updated production schedule ... print-out the week's sales results from the Dallas branch.

There's virtually no limit to how far you can reach with your microcomputer, ordinary telephone lines, and CROSSTALK.

Even if your own business and personal needs are closer to home, you'll appreciate CROSSTALK's compatibility with a wide user base ... smart terminal characteristics ... total modem control ... and the ability to capture data at a high speed for later off-line editing. CROSSTALK has extras you may not find in other programs. Data capture to memory buffer (and on-line display). Protocol error-checking file transfer. Modem/telephone hangup, and display of elapsed time of call. Command file power and flexibility. Remote takeover and operation. And much more.

There is a CROSSTALK version for almost every CP/M, CP/M-86, or IBM DOS based microcomputer system. See your dealer, or write for a brochure.



CROSSTALK

MICROSTUF®

1000 Holcomb Woods Parkway / Roswell, Georgia 30076

CROSSTALK is a trademark of Microstuf, Inc. CP/M and CP/M-86 are trademarks of Digital Research, Inc. IBM is a trademark of International Business Machines, Inc.

CIRCLE 326 ON READER SERVICE CARD

Don't Blow Your Chance to Enhance.

Today when you need more information to make your business more profitable and manageable, the last thing you need is a dead end computer system. Fortunately, if you are a PC owner, your machine is flexible and can change and grow as your needs do. Unfortunately, good computer advice is hard to find, and smart buying decisions are harder to make. But there's no need to go off the deep end.

PROGRESSIVE MICRO DISTRIBUTORS specializes in upgrading machines. Whether you need faster processing or larger memory capabilities, accessibility to central files, communications or distributed processing applications, we've got the products to do the job right. Add to that our expert product knowledge, competitive prices, complete in-house stock, technical support, customer service and same day shipping, and you'll discover what has put PROGRESSIVE MICRO DISTRIBUTORS at the forefront of computer/peripheral suppliers.

Call PROGRESSIVE MICRO DISTRIBUTORS' TOLL FREE NUMBER, 1-800-446-7995. Let's discuss what's new in the market and what product is appropriate for your computing needs. Going one-on-one with local dealers can be time consuming and useless. They rarely have the latest products, or a straight answer. PROGRESSIVE MICRO DISTRIBUTORS keeps abreast of the latest technological trends and problems by talking to hundreds of people just like you, everyday. Whether you need chips or an entire network system, we've probably got the solution to your problem, in stock and ready to ship!

See our ad next to the Advertisers Index for the latest state-of-the-art enhancements.

CIRCLE 124 ON READER SERVICE CARD





Combine VISION with PC Graphics



**Captures
Anything You Can See.**

IMiGIT adds icon-
selected Graphic
Functions, text, and
textures with a full
palette of vibrant colors.

Together You Enjoy
Unparalleled Economy
and Applications
Flexibility.



*The illustration incorpo-
rates line art, photos, text,
textures and color elements.
You can do the same with
this icon-driven, user-
friendly system.*

For \$695.00 you get the PC-EYE™ video digitizer board and IMiGIT™ graphics software. PC-EYE allows you to capture real-life images with an ordinary video camera or VCR and produce them on your personal computer. IMiGIT is an icon-oriented graphics software package which allows you to modify the camera image by adding text, patterns, colors, lines and shapes. By using cut and paste features with multiple video images, you can store images for later retrieval and print images from the screen.

You get this Exciting Tool for integrating video images with graphics created by other software packages like Lotus 1-2-3*, Grafitalk*, CAD and business presentation packages. Imagine combining a real-life camera image, text and a pie chart generated by Lotus into one picture. It's really as easy as 1, 2, 3.

IMiGIT Supports . . .

High Resolution - up to 640 x 512 pixels with 16 colors or gray scale (64 with 6-bit PC-EYE). Flexibility - to support the most popular graphics cards and printers for convenient display and hardcopy output. Speed - less than 2/10 of a second to capture an image in the IBM-compatible 320 x 200 mode. All in all, a powerful but easy-to-use package that allows you to develop sophisticated and dramatic graphic presentations.



CHORUS is the Single Source for your graphics and imaging needs. Complete solutions in both hardware and software. Call us for other low cost/high performance imaging products such as Dr. Halo* and Halo* graphics software; video cameras and accessories; and graphic adapter cards. You can expect prompt delivery, technical support and complete OEM design assistance.

**CALL 1-800 OCHORUS or
603-424-2900.**

**PC-EYE and IMiGIT are trademarks of
Chorus Data Systems, Inc.**

*Dr. Halo and Halo are trademarks of Media Cybernetics, Inc.
Grafitalk is a trademark of Redding Group, Inc.
Lotus 1-2-3 is a trademark of Lotus Development Corporation

CIRCLE 184 ON READER SERVICE CARD

CHORUS

THE ADVENTURE CONTINUES . . .



\$49⁹⁵

SOMETHING BRAND NEW

INSTANT DATABASES . . . BECAUSE THAT'S HOW MOST OF US NEED INFORMATION . . . INSTANTLY!

Homebase provides you instant access to a whole realm of databases. Just hit the hotkey to freeze whatever software you're working in, and you're ready to find, insert or manipulate data.

This is much more than a simple cardfile or mini-database. You'll be able to set up your own templates, define parameters such as the length of a field, and do rapid key searches. You can have thousands of records in a database. And numerous databases on your menu.

THE TOOLS YOU NEED.

We've included a powerful set of tools that will save you time and help you organize information, schedule, calculate and do a whole lot more. All within a quick keystroke . . . regardless of the software you're running! You may find a few of these in some "desktop" products . . . but nothing else approaches the power of Homebase!

- | | |
|--|--|
| <ul style="list-style-type: none">• Instant Databases• Phone Message Pad• Rolodex™• Appointment Calendar• Calculator• Notepad• Time and Expense Diary• Programmable Hotkey (You choose the key that gets you to your Homebase)• Electronic Mail (as an automatic, multi-task)• Tables and Pages (for those things you always need to look up)• Alarm Clock (including Musical Snooze Alarm)• To-Do List | <ul style="list-style-type: none">• Quickterm Terminal (available even when you're working in another program)• Autodialer• Template Maker (for designing your own databases)• DOS Services• Rolodex Card Printer• Mailing Label Printer• Data Transfer (between databases or your other software)• Cut and Paste (great for putting together an Electronic Mail letter that combines a chunk of spreadsheet, some text from a document, and a few notes) |
|--|--|

THE EXCITEMENT IS BACK

With the Electronic Mailbag of Your Dreams

ELECTRONIC MAIL THAT TAKES CARE OF ITSELF . . . IN THE BACKGROUND

(While you're running WordStar, Lotus, dBase, a compiler or whatever)

We wanted electronic mail that could take care of itself while we were busy on the computer doing something else.

We always felt that there was something strange about having to play postman every time a piece of electronic mail was due.

It was always a case of loading up a communications package and either waiting for the mail or going out to fetch it.

Now, we've got it! And you can have it, too. With HOMEBASE, Electronic Mail can arrive while you're working in another piece of software. Up in the corner of your screen, a signal lets you know that there's incoming mail. You can read it as it comes in, if you want. Or you can ignore it, and your mail will automatically file itself . . . to be read at your leisure.

When you're sending Electronic Mail, it's just as easy. Once you've written and addressed your letter, the rest is done for you, automatically, while you're back working in another piece of software.

CHECK THE DIFFERENCE IN VALUE!

WHY ARE YOU GETTING SO MUCH SOFTWARE FOR SUCH A SMALL PRICE?

Amber Systems makes tools for programmers including VSI—The Window Machine. We make mouse drivers, asynchronous drivers and electronic mail packages for a number of companies. Now, we've decided to use these tools, plus some new ones that aren't yet on the market, to produce new concepts in software. Because we make the tools ourselves, our costs, and consequently yours, are the lowest possible . . . with never a compromise in quality.

YES! Site licenses are available for companies . . . large and small. If you would like to order a single copy, now, to examine and show around your company, its cost can be deducted, later on, from your site license. For further information on site licenses call 408-996-1883.

HOMEBASE	SIDEKICK	POLY WINDOWS	SPOTLIGHT
Notepad Autodialer Appointment Calendar DOS Services Calculator Rolodex Rolodex Card Printer Tables and Pages Alarm Clock Template Maker Instant Databases Data Transfer Cut and Paste Programmable HotKey Phone Message Pad Time and Expense Diary To-do List Electronic Mail Quickterm Terminal Mailing Label Printer	Notepad Autodialer Calendar Calculator ASCII Table Rolodex	Notepad Keyboard Macros Calendar Calculator Game Alarm File Cards	Notepad Calendar DOS Services Calculator Rolodex File Cards
\$49.95	\$49.95	\$49.95	\$149.95
\$49.95 !			

Sidekick is a trademark of Borland International, Inc. Poly Windows is a trademark of Polihon Corp. Spotlight is a trademark of Software Arts.

ORDER YOUR COPY OF HOMEBASE TODAY!

For VISA and MasterCard Orders Call Toll Free 1-800-334-0300

(Call anytime — lines open 24 hours a day, 7 days a week)

or fill in this ORDER FORM and enclose a check, money order or your VISA or MasterCard number.

HOMEBASE is available for the IBM PC, XT and true compatibles
\$49.95 + \$5 for shipping and handling*

NAME _____
TITLE _____
COMPANY NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
HOME PHONE () _____ WORK PHONE () _____
O CHECK O MONEY ORDER O MASTERCARD Card # _____ Exp. date _____

30-day money-back guarantee!

SEND TO:

AMBER
AMBER SYSTEMS, INC.
1171 S. Saratoga-Sunnyvale Road
San Jose, CA 95129

*California residents add 6% sales tax. Outside U.S. please add \$15. Checks must be on a U.S. bank and in U.S. dollars. Sorry, no C.O.D. or purchase orders.
For dealer and site license information, call 408-996-1883. PC: H&G

CIRCLE 107 ON READER SERVICE CARD

At Last...The Next Generation Ultra High-Res. Color Graphics Board For Your IBM PC/XT/AT

Only

ColorPAK™

From Tseng Labs
with FREE GraFIX Partner™ Provides

- Support "Symphony"™ in 640x200, 4 Color Mode
- Graphics Enhancement to 16 Colors, 640x200 Resolution
- Software Compatibility in 640x400 Ultra-High Res. Mode with SoftPAK™
- 50 Line Super Spreadsheet Display
- Presentation Graphics • Extended Graphics
- Configurability • Expandability • Growth

Suggested Retail \$580.

SoftPAK™ \$99.

At 4:00 a.m., after a 22 hour day in the development lab, even a nice soft spoken artist/technologist like Jack Tseng starts painting new pictures. "Why don't we pull out all the stops and give our customers everything they've always wanted in a color graphics board with 3270 PC quality but at a vanilla PC price. That way, they can start with an IBM monitor and grow into a high resolution monitor as the requirement changes. We'll give them a free piece of software to transform their existing graphics packages into high quality business presentation graphics, like GraFIX Partner™. Plus all the UltraPAK options they've grown to love at a highly affordable price!" And so ColorPAK was born.

Systems Supported: IBM PC, IBM PC/XT, PC/AT, ITT XTRA™, Sperry™, Eagle PC™, TAWA™, Leading Edge™.

Monitors Supported: IBM, Princeton Graphics Systems, HD-12, SR-12 (640x400), Amdek, Taxan, and other IBM compatible color monitors.

*Enhancement Technology
For Personal Computers*



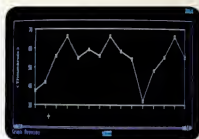
Tseng Laboratories, Inc.

205 Phessant Run, Newtown Commons, Newtown, PA 18940

(215) 968-0502 TELEX 705179

CIRCLE 207 ON READER SERVICE CARD

1



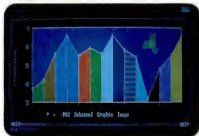
Typical Graphics Software, e.g. "Symphony"™ Graphics in Either IBM 640x200 Resolution in 2 Colors, or Plantronics™ 4 Color Display.

2



One Keystroke Accesses the Ultra-High Resolution, and Extended Graphics Richness of ColorPAK™ Enhancement Technology.

3



RESULT! "Symphony"™ 16 Color Business Presentation Graphics After Applying the Power of ColorPAK™ and GraFIX Partner™.

PRODUCT COMPARISON		
	ColorPAK	IBM Color Adapter
Functionality		
640 x 400 Graphics 4 color	Standard	Not Available
640 x 200 Graphics 16, 4, 2 color	Standard	2 Color Standard only
320 x 200 Graphics	Standard	Standard
80 x 80/25 Text Display	Standard	Only 80 x 25
40 x 25 Text Display	Standard	Standard
Compatibility With IBM Color Monitor	100%	100%
Ultra High Res. Monitor	100% w/SoftPAK™ option	Not available
Configurability/Growth	On-board selection for IBM or high Res. monitor	Medium Res. only
	Upward Growth	No Growth
Expandability		
64-384K	w/UltraRAM	Not Available
High Res. Compatibility	w/SoftPAK™ option card	Not Available

*Piggyback hardware option to insure IBM compatibility with Ultra high-res. monitor.

IBM News

FROM THE EDITORS OF PC

MARCH 19, 1985

Fighting the Pirates With a Lock and a Key

Most major software manufacturers are preparing to lock up their treasures.

BY DON KENNEDY AND CRAIG STARK

NEW YORK—An armada of some of the software industry's biggest ships is being formed to battle the pirates who have been stealing their goods. Flying under the standard of ADAPSO, the Association of Data Processing Service Organizations, such captains of the industry as Microsoft's William Gates, Lotus's Mitchell Kapor, Ashton-Tate's Edward Esber, MicroPro's Glen Haney, Multimate's Wilton Jones, and Lifetree's Camilo Wilson are preparing to arm their software with new protection schemes to prevent the assault of those who would copy them illegally.

Those individuals have endorsed ADAPSO's goal of setting an industry-wide standard to provide a hardware-based software authorization system. In effect, this means that in the future, most of the best-selling business software will run only when additional pieces of hardware are added to the system to "unlock" the software's authorization code. People trying to use illegal copies, in other words, will be sunk.

High Security

The proposed software authorization system is one part software and two parts hardware. The software part, referred to as the "lock," is a module embedded in the program that prevents the program from running correctly without proper "authorization." The hardware compo-

nents are usually referred to as the "key" and the "key ring."

The key ring is a hardware device that holds the user's collection of keys for various software programs. When a software program protected under this scheme is started, it will look in the key ring for either the correct serial number or, more

likely, the physical key that is included with the software. The "key," which contains at least one microchip, is a device about the size of a door key that plugs directly into the key ring. It is expected that software vendors will design custom keys for their products, although off-the-

(continued on next page)

MicroPro Sues American Brands

BY CHARLES BERMANT

CHICAGO—An office supply firm is the object of a suit that accuses it of rampant unauthorized software duplication of one of the country's largest selling software products.

MicroPro International, of San Rafael, Calif., has charged American Brands, Inc., and its Chicago-based subsidiary, Wilson Jones, of high-volume

copying of *WordStar*, *SpellStar*, and *MailMerge*. Neither side would discuss the particulars of the case, but sources said the alleged bootleg programs were used within the company and not resold.

WordStar, one of the country's most popular word processing programs, is thought to have one bootleg copy in exist-

tence for every legitimate copy sold. MicroPro CEO Glen Haney said that this statistic is "no longer just for ourselves, but is an industry fact." He said the suit was "an effort on behalf of the software industry to protect its property."

A representative of American Brands refused comment about the suit. American Brands is the 79th largest corporation in America.

MicroPro is joined in the suit by The Association of Data Processing Service Organizations (ADAPSO), which reportedly discovered the infringement. A settlement of \$225,000 or actual

(continued on next page)

Fighting Pirates (continued)
shelf keys should be available if the scheme catches on.

In addition to protecting the software manufacturer, this authorization system has one big advantage for users over other copy-protection schemes, at least according to ADAPSO. This "key" system allows you to make backup copies of the program for your own protection.

The key ring will be "transparent," connected to the computer through the RS-232 serial port with a pass-through connector that permits the serial port to also be used for another function, such as a printer or modem. The software authorization system is invisible to ongoing communications through the serial port up to speeds of 19.2 kilobaud, thus making a dedicated serial port unnecessary.

Attempting to avoid problems with potential restraint-of-trade and antitrust actions,

ADAPSO's working white paper makes it clear that "the proposed standards will not specify a particular device (key ring) or authorization method. Specific implementations will be left to software vendors and third-party hardware vendors."

Other Steps

The key-ring proposal is only part of an announced four-pronged approach to the problem of software piracy. In addition to technical protection, ADAPSO is also pursuing the enacting and enforcement of laws protecting software copy-rights, public education on the issue of illegal duplication, and enforcement of laws protecting the rights of software manufacturers. The latter has already prompted ADAPSO to join with MicroPro in its recent suit against Amazon Brands and Wilson Jones (see related PC News story in this issue).

Other industry leaders en-

dorsing ADAPSO's attempts to create industry-wide standards include Leland Strange of Quadram, Tom O'Brien of BPI, David Solomon of BPS, Inc., James Harper of Remote Systems, Inc., John Imray of Management Science America, Charles Milden of State of the Art, Iain McFarlane of PowerBase Systems, Roy Folk of Paladin, Richard Dunfee of Wadsworth Professional Software, David Winer of Living Videotext, and Sean O'Connor of Decision Resources.

According to information that was supplied by ADAPSO, its 750 members account for more than 60 percent of the dollar volume of the software industry. Its headquarters are at Suite 300, 1300 N. 17th Street, Arlington, Virginia 22209, (703) 522-5055.

MicroPro Sues (continued)
damages is being asked. ADAPSO spokesman Dave Sturtevant said there was "strong evidence" of illegality before action was taken.

While few such suits have been successful, Sturtevant declined to call the action a "test" case. He said the software programs were copyrighted, and, if the defendants ignored that copyright, it was a blatant violation of a nonambiguous law.

Last year MicroPro unveiled *WordStar 2000*, its first copy-protected product. Haney said that reaction to this step has been mixed, but that it was ultimately "profile positive." He underlined his support for an industry-wide, software-addressible chip built into all machines, but added "there are no ideal fixes" for software piracy.

Software Ripoff

Future Computing study reports 50 percent of all software may be unauthorized copies.

DALLAS—Half the business software in America is pirated. That sounds like there's a lot of buccaneers out there; Future Computing says that a survey it conducted in the third quarter of 1984 reveals that 50 percent of the installed base of business software in the United States consists of unauthorized copies. That amounts to a \$600-million-dollar loss of revenue last year alone.

The Dallas-based research firm conducted the survey with the Association of Data Processing Service Organizations (ADAPSO), which was involved with the project as part of its continuing campaign against software piracy. Future Computing estimates that software piracy has cost the industry \$1.3 billion in lost revenues between 1981 and 1984 and projects losses nearing \$800 million this year (see Figure 1).

The study focused on software in a variety of price ranges and discovered that illegal copying took place across the entire spectrum (see Figure 2). In addition, illegal copies are being made of programs with built-in copy-protection schemes as well as those without such "safeguards."

Joe Curry, the Future Computing analyst who conducted the survey, said that the prevalence of software copying reduces revenues for current products and makes it more difficult for entrepreneurs to attract venture capital for new software companies and products.

The survey was released as part of ADAPSO's launching of a major campaign against software piracy. The programs studied in the survey were *dBASE II*, *PFS:File*, *PFS:Report*, *1-2-3*, *Multiplan*, *VisiCalc*, *BPI General Accounting*, *Apple Writer II*, *EasyWriter*, *HomeWord*, *MultiMate*, and *WordStar*.

Future Computing is located at 8111 LBJ Freeway, Dallas, TX 75251, (214) 437-2400. The survey's results are available in "Office Personal Computer Software Markets" and "Office Personal Computers: The Customers."

—Don Kennedy

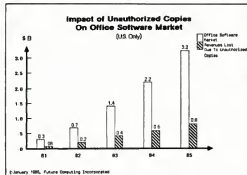


Figure 1: This chart shows lost revenues resulting from unauthorized software copying.

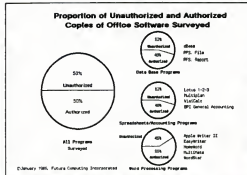


Figure 2: The survey's results reveal across the board piracy.

Apple's Net Snares IBM

Apple's Macintosh Office System makes plans to reach out to PCs.

BY JAMES LANGDELL

SAN FRANCISCO—At a stockholders meeting here on January 25, 1985, Apple Computer, Inc., introduced a group of new products, parts of a system Apple dubbed the "Macintosh Office." The most surprising part of Apple's latest thrust into the business market is that its Macintosh Office will accept IBM PCs as equal (or more than equal) partners in Apple's local area network, the new AppleTalk Personal Network.

An AppleTalk network can connect up to 32 personal computers and peripherals within a range of 1,000 feet. When the system is first available in March 1985, it will be able to link Apple's Macintosh-series computers, hard disks, and LaserWriter printer—a new \$7,000, 8-page-per-minute laser-xerographic printer.

Each Macintosh computer can be added to the network for only \$50 and the cost of any additional lengths of shielded twisted-pair cable. No add-on boards are needed—a vital prerequisite when dealing with the slotless Macintosh. These Ap-

ple-to-Apple connections are cheap and easy because most of the needed network circuitry is already built into Apple's Macintosh computers and new peripherals.

Due to AppleTalk's open architecture, Apple claims that it and other developers will soon be able to offer products that link non-Apple computers and peripherals to the network. Apple even plans to sell a board that will connect IBM personal computers through AppleTalk. This PC add-on board will cost about \$300 and should be out this fall. The accompanying software will even permit an IBM computer with a hard disk to be used as file server for an otherwise all-Apple network.

Compared to IBM's PC Network, AppleTalk is slow—its 230 kilobits per second speed can't touch IBM's 2-megabit rate, but IBM's price is correspondingly higher.

Apple claims that intelligent gateways can be developed to link an AppleTalk network with other networks, such as the faster and more extended PC Network system. ■

Doing the PC Shuffle

IBM steps up PC dealer sales and support.

BY CHARLES BERMANT

ARMONK, N.Y.—IBM has reshuffled its PC division, changing its consumer distribution channels. The Entry Systems Division (ESD) has been relieved of its dealer sales, support, and operations duties, which have been transferred to the National Distribution Division (NDD).

The ESD will continue to be responsible for the marketing

strategy, development, and manufacture of PC products. The NDD is expected to involve itself in all aspects of support for the more than 2,000 authorized IBM PC dealers. IBM states the move "shows a continuing commitment" to the PC line and will make the distribution process more efficient.

The distribution centralization is expected to benefit inde-

ANALYSIS

Little Action in Las Vegas For PCs at Winter CES

BY MARTIN PORTER

LAS VEGAS—Looking for IBM PCs at the Consumer Electronics Show (CES) in Las Vegas in January was like looking for winners at Keno. You know there had to be some, but they were awfully hard to find.

You couldn't miss Commodore's CES billboards, though: propped up beside promotions for Joan Rivers at Caesar's and Wayne Newton at the MGM Grand, they read, "Bad News for IBM and Apple." With this pitch, Commodore, the denizen of micro low-end, was promising that its first line of 128K machines would go head-to-head with the two big micro makers. It is reliably rumored that neither IBM nor Apple trembled as a result of the billboards.

Commodore is trying to blow some fresh air into its dwindling market share with the first Commodore PC, a 128K (expandable to 512K) micro that can use all 6,000 Commodore 64 software titles and can also run CP/M standards such as *WordStar* and *dBASE II*. Frankly, more attention seemed to be paid to the portable version of the machine, which features

32K RAM, a readable 80-column-by-16-line LCD screen, built-in text editing, file management, spreadsheet, and communications software—all for about \$550.

Diamond Jack

Commodore sorely needed to make a splash since, at a nearby booth, former Commodore president Jack Tramiel, now on the throne at Atari, was holding court. With the slogan "Power without the Price," Tramiel was going for Apple's core with an under-\$500 machine aimed at the Macintosh. Quickly nicknamed the "Jackintosh," the 16/32-bit ST line of computers makes use of Motorola's 68000 microprocessor—also the heart of the "Computer for the Rest of Us."

Some analysts have been anticipating a similar "Jack attack" on the MS-DOS front, following Atari's rumored acquisition of the enhanced graphics and PC-compatible technology of Mindset, a machine that was nowhere to be found. Well-placed sources revealed that negotiations between Atari and Mindset are on hold, at least for now.

Orient Express

In fact, the only PC-compatibles on the main floor at the Las Vegas Convention Center were at the booth of Goldstar of Korea. Goldstar introduced a range of PC-compatibles with dual disk drives, 10-megabyte hard disks, and integral tape backup. A Goldstar executive said the machines will be available this spring on an OEM basis, at prices "that should beat IBM's." Don't be surprised if they soon carry the Honeywell name.

Other attempts at getting an Oriental slipper in the door of the American micro market

(continued on page 39)

pendent dealers and not undercut them in favor of IBM's own Product Centers. It may also give the company the means to better control rising "gray market" PC sales, although company spokesperson John Q. Pope denied any connection between the reorganization and growing signs that IBM is attempting to gain closer control over the distribution of its products.

Pope said the move should permit IBM to give its dealers "more management attention on all facets of operation," and in turn, allow the Entry Systems Division to increase its development and marketing efforts. ■

New!
70 MB & 120 MB drives.
Plus choice of 10 MB Cartridge
or Streaming Tape back up.

We have a missing piece for your IBM PC.

The IDEAmax 384



IDEA Associates

The IDEAcomm 1200



IDEA Associates

The IDEAcomm 3278



IDEA Associates



IDEAmax



IDEA Associates

IDEAgraph



IDEA Associates

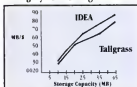
IDEAdisk. The best idea in disk drives.



There are lots of disk drive manufacturers waiting in the grass for you. They're all trying to sell you price. Or performance. Or both.

We want to set the record straight. IDEAdisk has always been the price/performance leader. We introduced built-in backup with the removable Winchester cartridge back in 1982. And we've stayed ahead of the crowd ever since.

IDEA offers better features. Higher quality. And a lower price. With IDEAdisk prices starting at \$1,595, you get more megabytes of storage for each dollar invested.



(Based on published manufacturers' suggested retail prices)

What makes IDEAdisk even better is our unique trade-up policy. The only trade-up policy in the business. So when you buy a disk drive today, and want to trade up tomorrow, you haven't wasted

your money.

You've invested it.

Every IDEAdisk undergoes rigorous testing before it is shipped. Piece by piece, and as a subsystem. This means we can offer a full year of limited warranty, compared to the industry-standard 90 days.

IDEAdisk features include:

- The best backup: Built-in backup with removable Winchester cartridge. Faster, more reliable than tape!

- The best storage combinations: 5, 10, 15, 25, 45 MB capacities. Combine two IDEAdisks and get almost 100 MB of storage. IDEAdisk Plus adds memory, serial port, and clock options without using another expansion slot.

- The best software, free.

Disk Caching: Access most frequently used files at RAM speeds. Accelerates your word processing, database, accounting applications.

Self Booting: Turn on your PC and access the hard disk directly. No floppies required.

Dynamic Partitioning: Segments the disk into logical drives for different applications or multiple (up to 40) users. Private/shared files.

Security Features: Passwords, User ID's, file and record locking.

- The best resource sharing: Fully integrated with IDEAShare and IDEANet resource sharing products.

But IDEAdisk is just a piece of the whole IDEA story. We design and manufacture a full line of peripherals that are compatible with the IBM PC. And more importantly, compatible with each other.

Ask for IDEAdisk and the entire IDEA family of products at all Computer Depot, Math Box, Amerisource and Northeast Computer stores, plus selected Computerland, Inacom and MicroAge locations. For the name of the IDEA store nearest you, call us toll-free at 800-257-5027.

See why the best IDEA in disk drives is the piece you've been missing for your PC.

IDEA
IDEA Associates

The best IDEAS for personal computers.

IDEA Associates, Inc., 35 Dunham Rd., Billerica, MA 01821 (617) 665-6678 Telex 94-8245 IDEA Associates S.A., 5, Route de Chézay CB1267 Geneva, Switzerland (2166.11.19) Telex 428 588 KRSCH



IBM and the IBM logo are registered trademarks of International Business Machines Corporation. MicroAge is a registered trademark of MicroAge Computer Stores. IDEAdisk and IDEAdisk Plus are registered trademarks of IDEA Associates, Inc.

CIRCLE 334 ON READER SERVICE CARD

Hard Drives

You Can Forget About.



The nicest thing about Maynard's hard drives is their humility. They never draw attention to themselves. They simply do what you tell them to do, so you can keep your mind on your work, not your hardware. Unsurpassed performance. Versatile design. Superb reliability. We give you an awful lot to forget about.



*Internal, external, or portable
hard drives from 10 to 30MB.*



Maynard Electronics

430 E. SEMORAN BLVD., CASSELBERRY, FL 32707

305/331-6402

CIRCLE 437 ON READER SERVICE CARD

Report from Las Vegas:

New Products at CES

BY PHIL WISWELL

LAS VEGAS—The Winter CES is a huge phantasmagoria of light and sound, all flogging the latest in electronics. Of course, the computer, and the PC, is an electronic device, and the CES doesn't ignore this market. The following product offerings include software and peripheral conversions, as well as new products for the PC and PCjr.

Games

Avalon Hill showed its newest board-cum-computer games: *Incunabula*, in which you guide a civilization to full bloom, *Pro Manager*, a baseball simulation, and *The Game of Trivia*. Broderbund showed *The Ancient Art of War*, a series of historical military campaigns. CBS Software had *Quink*, a TV show-like trivia board game, and *Felony!*, the second in a series of murder mysteries.

CBS also showed two new construction sets, *Adventure Master*, which lets players write and draw their own text and graphics adventure games, and *The Railroad Works*, which lets you build and run complex toy train sets. Addison-Wesley introduced *Dr. C. Wacko's Miracle Guide to Designing and Programming Your Own Computer Arcade Games*. And Electronic Arts finally converted *Pinball Construction Set*.

Education

There were lots of new adventure games on display, such as Infocom's new *Suspect*, in which the player is accused of murder and must prove his innocence. But the adventure game market has expanded to include licensed literature, such as Sherlock Holmes's *Another Bow* (Bantam/Imagic), *Fahrenheit 451* (Trillium), and *The Holy Grail* (Hayden). Several companies showed educational adventures, such as Grolier's *Secrets of Science Island* and Milliken's *Adventure Alpha*.

There was less curriculum-based educational software at this show than in years past, as many publishers stressed less-specific learning activities. DesignWare showed four products in this area: *The Body Transparent*, an anatomy dissection lesson; *Remember*, a method for strengthening memory; *European Nations & Locations*, a graphic geography lesson; and *The Notable Phantom*, a music identification game. First Star Software converted its popular *U.S. Adventure* game for the PC and PCjr.

Productivity

Very little business software was on display, with one major exception: Thorn/EMI converted its popular Perfect series (*Perfect Writer*, *Speller*, *Thesaurus*, *Calc*, *Filer*, and *Link*) from the PC to the PCjr.

But home productivity soared, as publishers stressed money management (*Personal Money Motters* from Avant Garde, *Your Personal Net Worth* from Scarborough, J. K. Lasser's *Your Income Tax*, and *Your Money Manager* from Bantam), health (*The Original Boston Computer Diet* from Scarborough and *The Complete Scorsdale Medical Diet* from Bantam), music and graphics (*The Music Shop* and *The Print Shop* from Broderbund and *Songwriter* from Scarborough), and writing (*Computer Novel Construction Set* from Hayden, *Build a Book About You* from Scarborough, *The Newsroom* from Springbrook, *SkWriter II* word processor from Prentice-Hall, *MasterType's Writing Wizard* from Scarborough, and *HomePak* from Batteries Included).

Peripheral Hardware

The big news at the show in peripherals could be summed up in two words: printers and graphics. Star Micronics devised several lines of inexpen-

Little Action (continued)

sive dot matrix and letter quality took place at the MSX computing display. Developed by Microsoft, MSX is promoted as "the new standard" by Japanese manufacturers whose names are synonymous with consumer electronics but who have had no luck in muscling in on Com-

modore and Atari.

deed find a niche in the American business computer market. The MSX machines on display ran a range of software applications, including Microsoft's *Multiplex*. Since the machines are all Z-80 based, they can choose from a wealth of existing software. In addition,



Atari put the Macintosh's 68000 processor in its inexpensive color system—the ST computers. The 130ST (top) has 128 KB of RAM; the 520ST (bottom) has 512 KB.

modore and Atari.

Despite the blue-ribbon backing of Panasonic, Sony, Pioneer, Sanyo, Hitachi, Mitsubishi, Canon, Yamaha, and Casio, the booth's bill was actually footed by Microsoft, whose Japanese vice president, Kay Nishi, was on hand to convince naysayers that MSX could in-

MSX machines are "file compatible" with MS-DOS, a feature that may poke some holes in exploding PCjr sales.

"The door may be closed," Nishi said, acknowledging market doubts that the Japanese could make a micro splash on this side of the Pacific. "But the window is still open." ■

sive dot matrix and letter quality printers that are switch-selectable for most home and personal computers. Riteman also came on strong with five new dot matrix printers aimed at the home market. Legend showed three new wide-bodies for office use. All the new printers boasted increased throughput times, clearer type, and more front-panel options.

Tech Sketch showed a light pen along with Micro Illustrator software. And an unknown company called Soniture had a gimmicky pen, called the Space Tablet, that allows you to draw in mid-air—without touching a tablet or screen. Axiom showed its new Penman plotter, an at-

tractive 13½-inch × 5-inch × 2-inch unit.

Other peripherals included a chemistry experiment lab from Simon & Schuster, a Muppet Learning Keys keyboard for children from Koala Technologies, and The Personal Graphics System, a powerful graphics generator capable of displaying 250,000 of its 2 million colors simultaneously. Wico Corporation of Niles, Ill., a joystick manufacturer, introduced the SmartBoard, a programmable keyboard trackball peripheral for the IBM PC. The 126-character keyboard allocates 256 bytes to the ten function keys and a trackball that can replace the cursor keys. ■

Go ahead . . .

TAKE THE CREDIT!



★ cash discount prices!

* no annual or membership fee.

You've made

★ CONROY-LAPOINTE

The World's Largest Computer
Mail-Order

Mail-Order Firm!

So now we bring

★ you the convenience and

preferred status of being one of
OUR VERY OWN CHARGE CUSTOMERS!

Initial minimum purchase

★ is only \$400. There's no minimum purchase amount once your account is open.

As a CONROY-LAPOINTE

★ charge customer, you'll benefit from the convenience of credit privileges . . .

- at cash discount prices!
- with no annual or membership fee.
- so you won't tie up personal or company cash.
- so you won't tie up other credit lines.

Corporate customers:

*** you can use our credit *
card like net 30 terms!**

★ Send in the coupon for your application

(800) 547-1289

TELEX 910 380 3900

DISKETTES

• CONROY-LAPOINTE™ DISKETTES •

10-ss. 05/00 (IBM H/P) 48 T/s	\$ 15
100-ss. 05/00 (IBM H/P) 48 T/s	\$ 110
200-ss. 05/00 (IBM H/P) 48 T/s	\$ 220

• CONROY-LAPOINTE™ •

IBM PRE-FORMATTED			
10 ea.	05/00	48 Track (IBM PC Pre-formatted)	\$ 19
100 ea.	05/00	48 Track (IBM PC Pre-formatted)	\$ 149
1000 ea.	05/00	48 Track (IBM PC Pre-formatted)	\$ 859

		LIST	OUR
CDC,	10 ml SS/50 40T (Apple IBM)	\$ 56	21
	100 ml SS/50 40T (Apple IBM)	\$ 550	185
	10 ml SS/50 40T (IBM HP)	\$ 75	31
	100 ml SS/50 40T (IBM HP)	\$ 750	282
GYSAN,	10 ml SS/50 (Apple etc.)	\$ 40	27
	10 ml SS/50 48T (Apple)	\$ 69	25
MAXELL	10 ml SS/50 M2T1 (Amper)	\$ 55	11
	10 ml SS/50 3 1/4" (MAC)	\$ 80	35
	10 ml SS/50 M22 (IBM)	\$ 75	29
	10 ml SS/50 1/2 Denar (IBM-AT)	\$ 77	41
MEMOREX	10 ml SS/50 3 1/4 (MAC)	\$ 65	35
VERBATIM	10 ml SS/50 M20M-01 (Apple)	\$ 48	27
	10 ml SS/50 M20M (IBM)	\$ 84	32

PRINTERS

DOT MATRIX

[illegible]

LETTER QUALITY

JUNO, 4200—40 cps para	\$ 965	\$ 795
8100—18 cps para, 3 pitch	\$ 509	\$ 449
TTA, 1014—12 cps para/ser p 8 h 3p	\$ 499	\$ 385
1014—same as 1014 w/7MF 2t & prep	\$ 539	\$ 439

MONITORS

[illegible]

MODEMS

ANCHOR, Signaler Mark 20 (IBM)	\$ 206	\$ 266
HAYES, 2400B External Modem (IBM)	\$ 896	\$ 896
Smartmodem 1200B (IBM)	\$ 506	\$ 600
Smartcom 2 Software (IBM)	\$ 140	\$ 90
Stack Chronograph (RS-232)	\$ 246	\$ 160
PROMETHEUS, ProModem 1200B (IBM)	\$ 306	\$ 289
QUADRAM, Quadramem Intemp (IBM)	\$ 585	\$ 625
Quadramem, Extemp (IBM)	\$ 695	\$ 695
VENTIL, PC Mail Card (IBM)	\$ 549	\$ 495
1200 Plus, External (IBM)	\$ 459	\$ 429
PC1200, Internal (IBM)	\$ 409	\$ 373

ACCESSORIES

Curtin, Diamond 8 outlets switched	\$ 50	\$ 29
Ernst 8 outlets 8 cont	\$ 80	\$ 35
Ruby 3 outlets 8 cont fiber	\$ 60	\$ 57
Sapphire 3 outlets w/fiber	\$ 80	\$ 46
EPD, Lemon 8 outlets/wall	\$ 80	\$ 29
Lime 8 outlets/floor	\$ 60	\$ 45
Orange 5 outlets/floor	\$ 140	\$ 60
Peach 3 outlets/wall	\$ 50	\$ 38
Rose 1 outlets/wall		CALL
NETWORK, wireless 4 outlets w/10 surge	\$ 70	\$ 39
PERFECT DATA, Head Cleaning X7	\$ 18	\$ 12
PROD TECH INTL, Uninterruptible Power Supply		
2000 Watts, PC2000 1000 WPM PC	\$ 499	\$ 399

CONVOY-LAPOINTE INC.

LOW PRICES TO PROFESSIONALS WHO KNOW WHAT THEY WANT AND KNOW HOW TO GET IT!
FOR YOUR IBM PC, XT, AT or JR

In 1984 by Convoy-LaPointe, Inc.
 All Rights Reserved

COMPUTER SYSTEMS

— Call for Details —
256K IBM PC

360K Disk Drives by CDC



90 Day Limited Warranty by CDC

COMPAG Portable

256K x 360K Disk Drive

SANYO 555-2

256K x 360K Disk Drive

TeleVideo PC

256K x 360K Disk Drive, 8008 Chip

256K

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

256K x 360K Disk Drive

DISK DRIVES

CDC, Limited 10 year warranty. Call for quantity prices.	LIST	OUR
Unit 100 360K D500	\$ 129	\$ 109
Unit 100 360K D500	\$ 309	\$ 149
Unit 100 360K D500	\$ 309	\$ 149
Unit 100 360K D500	\$ 309	\$ 149
Unit 100 360K D500	\$ 309	\$ 149
Unit 100 360K D500	\$ 309	\$ 149
Unit 100 360K D500	\$ 309	\$ 149
Unit 100 360K D500	\$ 309	\$ 149
Unit 100 360K D500	\$ 309	\$ 149
Unit 100 360K D500	\$ 309	\$ 149

OTHER HARDWARE

AST, SuperDisk 5.25" 5-1/4"	\$ 399	\$ 249
SuperDisk 5.25" 5-1/4"	\$ 399	\$ 249
SuperDisk 5.25" 5-1/4"	\$ 399	\$ 249
SuperDisk 5.25" 5-1/4"	\$ 399	\$ 249
SuperDisk 5.25" 5-1/4"	\$ 399	\$ 249
SuperDisk 5.25" 5-1/4"	\$ 399	\$ 249
SuperDisk 5.25" 5-1/4"	\$ 399	\$ 249
SuperDisk 5.25" 5-1/4"	\$ 399	\$ 249
SuperDisk 5.25" 5-1/4"	\$ 399	\$ 249
SuperDisk 5.25" 5-1/4"	\$ 399	\$ 249

OTHER HARDWARE

		LIST	OUR
MAYNARD, SAND STAR SERIES			
89	MultiFunction 8K (Card)	\$ 89	\$ 79
89	Memory Card 16K	\$ 139	\$ 109
89	Memory Card 32K	\$ 189	\$ 159
89	Frisky Cat Card (W/87/92 3 mode)	\$ 245	\$ 205
89	HardDisk 1.2 M	\$ 295	\$ 255
105	HardDisk 2 M	\$ 345	\$ 305
105	HardDisk 4 M	\$ 395	\$ 355
105	HardDisk 8 M	\$ 445	\$ 405
105	HardDisk 16 M	\$ 495	\$ 455
105	HardDisk 32 M	\$ 545	\$ 505
105	HardDisk 64 M	\$ 595	\$ 555
105	HardDisk 128 M	\$ 645	\$ 605
105	HardDisk 256 M	\$ 695	\$ 655
105	HardDisk 512 M	\$ 745	\$ 705
105	HardDisk 1024 M	\$ 795	\$ 755
105	HardDisk 2048 M	\$ 845	\$ 805
105	HardDisk 4096 M	\$ 895	\$ 855
105	HardDisk 8192 M	\$ 945	\$ 905
105	HardDisk 16384 M	\$ 995	\$ 955
105	HardDisk 32768 M	\$ 1045	\$ 1005
105	HardDisk 65536 M	\$ 1095	\$ 1055
105	HardDisk 131072 M	\$ 1145	\$ 1105
105	HardDisk 262144 M	\$ 1195	\$ 1155
105	HardDisk 524288 M	\$ 1245	\$ 1205
105	HardDisk 1048576 M	\$ 1295	\$ 1255
105	HardDisk 2097152 M	\$ 1345	\$ 1305
105	HardDisk 4194304 M	\$ 1395	\$ 1355
105	HardDisk 8388608 M	\$ 1445	\$ 1405
105	HardDisk 16777216 M	\$ 1495	\$ 1455
105	HardDisk 33554432 M	\$ 1545	\$ 1505
105	HardDisk 67108864 M	\$ 1595	\$ 1555
105	HardDisk 134217728 M	\$ 1645	\$ 1605
105	HardDisk 268435456 M	\$ 1695	\$ 1655
105	HardDisk 536870912 M	\$ 1745	\$ 1705
105	HardDisk 1073741824 M	\$ 1795	\$ 1755
105	HardDisk 2147483648 M	\$ 1845	\$ 1805
105	HardDisk 4294967296 M	\$ 1895	\$ 1855
105	HardDisk 8589934592 M	\$ 1945	\$ 1905
105	HardDisk 17179869184 M	\$ 1995	\$ 1955
105	HardDisk 34359738368 M	\$ 2045	\$ 2005
105	HardDisk 68719476736 M	\$ 2095	\$ 2055
105	HardDisk 137438953472 M	\$ 2145	\$ 2105
105	HardDisk 274877906944 M	\$ 2195	\$ 2155
105	HardDisk 549755813888 M	\$ 2245	\$ 2205
105	HardDisk 1099511627776 M	\$ 2295	\$ 2255
105	HardDisk 2199023255552 M	\$ 2345	\$ 2305
105	HardDisk 4398046511104 M	\$ 2395	\$ 2355
105	HardDisk 8796093022208 M	\$ 2445	\$ 2405
105	HardDisk 17592186044416 M	\$ 2495	\$ 2455
105	HardDisk 35184372088832 M	\$ 2545	\$ 2505
105	HardDisk 70368744177664 M	\$ 2595	\$ 2555
105	HardDisk 140737488355328 M	\$ 2645	\$ 2605
105	HardDisk 281474976710656 M	\$ 2695	\$ 2655
105	HardDisk 562949953421312 M	\$ 2745	\$ 2705
105	HardDisk 1125899906842624 M	\$ 2795	\$ 2755
105	HardDisk 2251799813685248 M	\$ 2845	\$ 2805
105	HardDisk 4503599627370496 M	\$ 2895	\$ 2855
105	HardDisk 9007199254740992 M	\$ 2945	\$ 2905
105	HardDisk 18014398509481984 M	\$ 2995	\$ 2955
105	HardDisk 36028797018963968 M	\$ 3045	\$ 3005
105	HardDisk 72057594037927936 M	\$ 3095	\$ 3055
105	HardDisk 144115188075855872 M	\$ 3145	\$ 3105
105	HardDisk 288230376151711744 M	\$ 3195	\$ 3155
105	HardDisk 576460752303423488 M	\$ 3245	\$ 3205
105	HardDisk 1152921504606846976 M	\$ 3295	\$ 3255
105	HardDisk 2305843009213693952 M	\$ 3345	\$ 3305
105	HardDisk 4611686018427387904 M	\$ 3395	\$ 3355
105	HardDisk 9223372036854775808 M	\$ 3445	\$ 3405
105	HardDisk 18446744073709551616 M	\$ 3495	\$ 3455
105	HardDisk 36893488147419103232 M	\$ 3545	\$ 3505
105	HardDisk 73786976294838206464 M	\$ 3595	\$ 3555
105	HardDisk 147573952589676412928 M	\$ 3645	\$ 3605
105	HardDisk 295147905179352825856 M	\$ 3695	\$ 3655
105	HardDisk 590295810358705651712 M	\$ 3745	\$ 3705
105	HardDisk 1180591620717411303424 M	\$ 3795	\$ 3755
105	HardDisk 2361183241434822606848 M	\$ 3845	\$ 3805
105	HardDisk 4722366482869645213696 M	\$ 3895	\$ 3855
105	HardDisk 9444732965739290427392 M	\$ 3945	\$ 3905
105	HardDisk 18889465931478580854784 M	\$ 3995	\$ 3955
105	HardDisk 37778931862957161709568 M	\$ 4045	\$ 4005
105	HardDisk 75557863725914323419136 M	\$ 4095	\$ 4055
105	HardDisk 151115727451828646838272 M	\$ 4145	\$ 4105
105	HardDisk 302231454903657293676544 M	\$ 4195	\$ 4155
105	HardDisk 604462909807314587353088 M	\$ 4245	\$ 4205
105	HardDisk 1208925819614629174606176 M	\$ 4295	\$ 4255
105	HardDisk 24178516392292583492123328 M	\$ 4345	\$ 4305
105	HardDisk 48357032784585166984246656 M	\$ 4395	\$ 4355
105	HardDisk 96714065569170333968493312 M	\$ 4445	\$ 4405
105	HardDisk 193428131138340667868986624 M	\$ 4495	\$ 4455
105	HardDisk 386856262276681335737973248 M	\$ 4545	\$ 4505
105	HardDisk 773712524553362671475946496 M	\$ 4595	\$ 4555
105	HardDisk 1547425049106725343511939968 M	\$ 4645	\$ 4605
105	HardDisk 309485009821345068702387968 M	\$ 4695	\$ 4655
105	HardDisk 618970019642690137404775936 M	\$ 4745	\$ 4705
105	HardDisk 1237940039285380274809551872 M	\$ 4795	\$ 4755
105	HardDisk 2475880078570760549619103648 M	\$ 4845	\$ 4805
105	HardDisk 4951760157141521099238207296 M	\$ 4895	\$ 4855
105	HardDisk 9903520314283042198476414592 M	\$ 4945	\$ 4905
105	HardDisk 19807040628566084396952829184 M	\$ 4995	\$ 4955
105	HardDisk 39614081257132168793905658368 M	\$ 5045	\$ 5005
105	HardDisk 79228162514264337587811316736 M	\$ 5095	\$ 5055
105	HardDisk 158456325028528675175622634624 M	\$ 5145	\$ 5105
105	HardDisk 316912650057057350351245269248 M	\$ 5195	\$ 5155
105	HardDisk 63382530011411470070249053856 M	\$ 5245	\$ 5205
105	HardDisk 126765060022822940140498097712 M	\$ 5295	\$ 5255
105	HardDisk 253530120045645880280996195424 M	\$ 5345	\$ 5305
105	HardDisk 507060240091291760561992390848 M	\$ 5395	\$ 5355
105	HardDisk 1014120480182583521123958781696 M	\$ 5445	\$ 5405
105	HardDisk 2028240960365167042247917573392 M	\$ 5495	\$ 5455
105	HardDisk 4056481920730334084495835146784 M	\$ 5545	\$ 5505
105	HardDisk 8112963841460668168899116713568 M	\$ 5595	\$ 5555
105	HardDisk 16225927682921337377982334327136 M	\$ 5645	\$ 5605
105	HardDisk 32451855365842674755964668654272 M	\$ 5695	\$ 5655
105	HardDisk 64903710731685349511929321308448 M	\$ 5745	\$ 5705
105	HardDisk 129807421463370699023786462617696 M	\$ 5795	\$ 5755
105	HardDisk 259614842926741398047572932533792 M	\$ 5845	\$ 5805
105	HardDisk 5192296858534827960951458650713856 M	\$ 5895	\$ 5855
105	HardDisk 1038459371767965592190291711211712 M	\$ 5945	\$ 5905
105	HardDisk 2076918743535931184380583422423424 M	\$ 5995	\$ 5955
105	HardDisk 415383748707186236876176684444688 M	\$ 6045	\$ 6005
105	HardDisk 83076749741437247375235328888937728 M	\$ 6095	\$ 6055
105	HardDisk 16615349948287447475047065777776 M	\$ 6145	\$ 6105
105	HardDisk 33230699896574894950094131555552 M	\$ 6195	\$ 6155
105	HardDisk 66461399793149789900182271111104 M	\$ 6245	\$ 6205
105	HardDisk 132922799586299579800364544222208 M	\$ 6295	\$ 6255
105	HardDisk 2658455991725991596007290884444416 M	\$ 6345	\$ 6305
105	HardDisk 5316911983451993192001481768888932 M	\$ 6395	\$ 6355
105	HardDisk 10633823966903986360029635377776 M	\$ 6445	\$ 6405
105	HardDisk 21267647933807972720059270755552 M	\$ 6495	\$ 6455
105	HardDisk 42535295867615945440118541511104 M	\$ 6545	\$ 6505
105	HardDisk 850705917352318908803708830222208 M	\$ 6595	\$ 6555
105	HardDisk 1701411834704637817607417660444416 M	\$ 6645	\$ 6605
105	HardDisk 34028236694092756352148352128888932 M	\$ 6695	\$ 6655
105	HardDisk 68056473388185512704296704577776 M	\$ 6745	\$ 6705
105	HardDisk 13611294677637102548549340955552 M	\$ 6795	\$ 6755
105	HardDisk 27222589355274205097098681911104 M	\$ 6845	\$ 6805
105	HardDisk 544451787105484101941973738222208 M	\$ 6895	\$ 6855
105	HardDisk 1088903542110968203883947476444416 M	\$ 6945	\$ 6905
105	HardDisk 21778070842219364077678949528888932 M	\$ 6995	\$ 6955
105	HardDisk 43556141684438728155357899057776 M	\$ 7045	\$ 7005
105	HardDisk 87112283368877456310675778115552 M	\$ 7095	\$ 7055
105	HardDisk 1742245667377549122413155552 M	\$ 7145	\$ 7105
105	HardDisk 348449133475509824482631111104 M	\$ 7195	\$ 7155
105	HardDisk 696898266951019648965262222208 M	\$ 7245	\$ 7205
105	HardDisk 13937965339020392979310524444416 M	\$ 7295	\$ 7255
105	HardDisk 27875	\$ 7345	\$ 7305

News In Brief

New Life at Victor...As soon as it was almost certain that Victor Technologies, Inc., was to emerge from Chapter 11 and be acquired by Datatronic AB of Sweden, Roy A. Wright resigned as chief operating officer of the once-bankrupt company. At this time, Victor has not named a new CEO to take Wright's place as the head of the soon-to-be-reorganized company. Wright has moved on to become the CEO at Corbus Systems, Inc., a San Jose, Calif., manufacturer of computers, disk drives, and peripherals.



Roy A. Wright

Copy Cat...It's natural that a leading maker of copiers would eventually copy the IBM PC. Canon USA, Inc., has introduced its line of Athena personal computers, desktop machines built around the 8086 chip.

The Athena is offered in two models: monochrome (\$2,495) and color (\$2,995). The prices include the appropriate monitor and graphics board. The color Athena provides 16 colors in character mode, 4 colors in 320 x 200 graphics mode, and a black-and-white high-resolution 320 x 400 mode.

Both models include two slender 360K disk drives. The motherboard holds 256K RAM, the disk controller, a parallel port, and a serial port. The Athena has five full-length slots, of which two have the 16-bit buses needed for the monitor controllers and the optional 256K memory expansion board (\$395). The other three slots are 8-bit, and Canon claims they are compatible with most add-on boards designed for the IBM PC.

Canon also bundles MS-DOS 2.1 and GW-BASIC 2.0 with the Athena. For further information, contact Canon USA, Inc., One Canon Plaza, Lake Success, NY 11042, (800) 323-1717 ext. 325.

See You Laser...NCR has introduced InteracTV, a user-interactive, computer-controlled laser videodisk system that operates under MS-DOS. Designed for employee training programs, catalog sales departments, and other high-storage information applications, the



NCR's InteracTV

system integrates color TV graphics with computer-generated text/graphic overlays. The overlays can be updated to reflect price or other changes without remastering the videodisk. Users can start, stop, reverse, or replay using a keyboard or a touch-screen.

The InteracTV system includes a specially modified NCR DecisionMate 5 PC with an integral 640 x 400 interlaced analog RGB display, a Pioneer LD-G1000 laser videodisk player, and a dual-channel sound system for bilingual or stereo audio. The system costs \$8,730 including its operating software, and the touch-screen option pushes the price to \$10,730.

For more information, contact NCR Corp., 1700 S. Paterson Blvd., Dayton, OH 45479, (800) CALLNCR.

Affordable Portable...Tandy Corporation recently introduced its Tandy 200 lap computer, an upgraded version of its popular Radio Shack Model 100. The new machine is .6 pounds heavier than the earlier model and features a larger (16 line by 40 character) LCD flip-up screen and the Multiplan spreadsheet package in ROM. Other improvements include 24K of RAM, expandable to 72K with additional 24K modules; built-in calculator and alarm programs; a tone-dialing capability and an improved communications program; and a socket for a plug-in 32K ROM chip. Features carried over from the Model 100 include BASIC, a built-in 300-baud modem, both parallel and RS-232C interfaces, cassette tape and bar-code reader interfaces, a simple word processor, a calendar/scheduler, and an address/phone directory.

The basic Tandy 200 will cost \$999 and is expected to hit the market sometime in early March. For more information, contact Tandy at 1400 One Tandy Center, Fort Worth, TX 76102 (817) 390-3011.

Young Techie...Although he just turned 13, Rawson Stovall has already had a book published by Doubleday, and he's a syndicated columnist whose advice about computer software appears in over 20 newspapers. Now you can see him regularly as one of the software and videogame reviewers for "The New Tech Times," a weekly public-television show. "The New Tech Times," produced by Friends of WHA-TV, Inc., in Madison, Wisconsin, will feature developments, products, and people in the technological, electronic, and computer industries.



Rawson Stovall

Jeff Clark, executive producer of "The New Tech Times," says that Stovall has the "business ability and vocabulary of a 40-year-old, but the mind-set of a 13-year-old." He added that Stovall will mostly review entertainment software for teenagers.

Dueling PCs...Leading Edge got suspicious when the shipments of its line of PC-compatible computers were delayed. Now Leading Edge is suing Mitsubishi, the manufacturer, because it claims Mitsubishi was stalling in order to ship directly to the market itself, thereby gaining a higher profit margin. Bill Sellers, vice-president of market research at Leading Edge, says that this action is in direct violation of the two companies' shipping agreement.

Hopefully, shipments of the new Leading Edge computer will go on as planned. Leading Edge plans to announce another PC-compatible computer in April that will be manufactured by Daewoo.

—compiled by Jane Mintzer,
with Barbara Krasnoff, James Langdell, and Craig Stark.

The new HERCULES Color Card gives you the parallel port IBM forgot-for \$1 more.



The new Hercules Color Card gives you these five important features in a color graphics card.

1. Full IBM color card compatibility.¹ Any program that runs on IBM's color card will run on the new Hercules Color Card at the same resolution.
2. A parallel printer port—standard on the Hercules Color Card, but forgotten by IBM on theirs.
3. It's short. The pint-sized Hercules Color Card fits in the short slot in an XT or Portable.² And it's AT³ compatible.
4. It can work in your system at the same time as the famous high resolution Hercules Graphics Card.⁴ And it will continue to work backed by our 2 year warranty.
5. Low price. At a suggested list price of \$245, the Hercules Color Card is only \$1 more than IBM's card.⁴ And our Graphics Pak[™] saves you even more money when you buy both Hercules cards at the same time.

Call 800 255-5550 Ext 420 for the name of the Hercules dealer nearest you. See why the company that made the first graphics cards for the IBM PC still makes the best.

	IBM Mono Display Compatible	IBM Color Display Compatible	Hi-Res Text	720 x 348 Hi-Res Graphics	320 x 200 Color Graphics	640 x 200 B&W Graphics	Parallel Printer Port
Hercules Color Card		•			•	•	•
Hercules Graphics Card	•		•	•			•
IBM Mono Card	•		•				•
IBM Color Card		•			•	•	

Hercules.
We're strong on graphics.

CIRCLE 146 ON READER SERVICE CARD

Address: Hercules, 2540 Nish St., Berkeley, CA 94710 Ph: 415 540-6900 Telex: 754963 Foreign distributors: Compuserve/Canada: Reflex/ U.K.: Computer 2000/W. Germany: Edisoft/France: Imagiteering/Australia: Holland Info Products/Holland: DataTeam/Scandinavia: Trademarka/Owners: Hercules, Graphics Pak/Hercules Computer Technology; IBM, AT: International Business Machines Notes: (1) An adapter is supplied for composite video. (2) The IBM Color/Graphics Monitor Adapter must be removed from the Portable before the Hercules Color Card is installed. (3) Model GB301 or later. (4) Based on the list price as of 7.1.84 for the IBM Color/Graphics Monitor Adapter.

PCnet™ from Orchid Technology



The Most Advanced, Affordable Way to Transform Your Personal Computers into a Fully Integrated, High-Speed Local Area Network.

NEW SOFTWARE

PCnet SPEED IMPROVEMENT

PRINTER SHARING

- Non-dedicated printer server on any PC

PCnetTALK
• Send message/
memo to one or
all PCs

DISKLESS CAPABILITY

- With remote host option, PC without diskette drive automatically downloads DOS from disk server at power up

RAM DISK
• Provides faster access than hard disk and diskette drive

DISK CACHING
• Improved speed in accessing data normally on the disk drive

EACH DISK/FILE SERVER

- Up to 16 public and private volumes
- More than one private/public read-write volume for each PC

Hard Disk

PCnet is the lowest cost network for IBM™ PCs. Take your choice.

\$495 per node when purchased as a stand-alone.

\$395 per node when purchased with BLOSSOM (384K RAM, Clock, IO)

Orchid, the creator of PCnet, has made high-performance local area networking affordable to all PC users. Contact your local dealer or Orchid today to unlock the

power of your IBM PC and find out more about our full line of products.

PCnet — Stand-alone Network Board

PCnetPlusRam™ — PCnet + 256K RAM

PCnetBlossom™ — PCnet + 384K RAM +

Serial Port + Parallel Port + Clock Calendar

Blossom™ — New Generation Multifunction Board

PCturbo™ — The Ultimate IBM PC

productivity enhancement board

IBM PC is a registered trademark of International Business Machine Corporation.
PCnet, PCnetPlusRam, PCnetBlossom, Blossom and PCturbo are all trademarks of Orchid Technology.



ORCHID TECHNOLOGY
47790 Westinghouse Drive
Fremont, CA 94539

(415) 490-8586 Telex: 709289

HIKE-UP YOUR AT!

WHY WAIT? GET 100% COMPATIBLE HARD DISK AND TAPE BACKUP FOR YOUR IBM® PC AT™ FROM MOUNTAIN TODAY.

Hike-up your basic AT to an enhanced AT with Mountain's internal hard disk. Installs in minutes using the AT's disk controller, power supply, and DOS 3.0. Choose from 20MB, 35MB or 120MB (formatted).

And don't forget our AT internal tape that lets you back up your irreplaceable files with complete confidence. It's fast. Economical. Easy-to-use. And installs in minutes. Complete with menu-driven software. Choose from 27MB or 60MB (formatted).

Both come network-ready to support Novell, Orchid PCnet®, NESTAR and 3COM Ether Series.

Why wait for IBM's hard disk when you can get just the capacity you need today. Plus reliable tape backup.

See them today at Entre (1-800-HI-ENTRE), Morris Decision Systems, MBI Business Centers, Office Technology Plus (Federal Agencies only), and other leading computer stores.

For more information, write: Mountain Computer, Inc., 300 El Pueblo Road, Scotts Valley, CA 95066. Or call (408) 438-6650. TWX 910-598-4504.



Mountain.
THE PEAK OF PERFORMANCE

1-800-458-0300 (in California, 1-800-821-6066)

In Canada, call Parity Plus Inc. (416) 673-3321.

In France, call Compusol 01-530 07 37.

In Sweden, call Nordic Data 08-730 50 50.

Mountain is a registered trademark of Mountain Computer, Inc. IBM is a registered trademark, and AT is a trademark of International Business Machines Corporation. PCnet is a registered trademark of Orchid Technology.
©1985 Mountain Computer, Inc.

CIRCLE 293 ON READER SERVICE CARD

All in all, WordPerfect is absolutely stunning.

PC Magazine

In the beginning, the creators of WordPerfect set out to design the perfect word processing software for business. Along the way, they tested each new function on the very secretaries who would eventually be using it. Thanks to them, the product lives up to its name: WordPerfect.

Easy.

Learning WordPerfect's basic text editing functions is quick and simple. Plus, comprehensive documentation and simple practice exercises help even beginners master WordPerfect's many other functions easily.

PC World

Fast.

With WordPerfect's document orientation, you never have to wait between pages of text. No matter how fast you type, WordPerfect won't slow you down.

Complete.

In addition to standard word processing functions, WordPerfect includes many extra business features, such as a 100,000-word phonetic dictionary; table and index generation; multi-page foot-

noting; automatic outlining and paragraph numbering; and a network version.

Get the business word

processor that's living up to its name. WordPerfect.

For more information, see your dealer. Or call or write:

WordPerfect makes putting together a professional-looking balance sheet or financial report easy.

BYTE

SSI Software
288 West Center Street
Orem, Utah 84057
Information: (801) 224-4000
Order Desk: 1-800-321-4566,
Toll-free



SSI Software
Reaching for perfection.

WordPerfect is a word processor for business applications.

PRODUCT REVIEW

Some BASIC Improvements

Summit's Better BASIC lives up to its name.

BY JOHN M. WORAM

Editor's Note: Last issue, PC News took a look at Morgan Computing Company's Professional BASIC. This time, the quest for a better BASIC continues with a look at—what else?—Better BASIC.

Better BASIC

Summit Software Technology, Inc.

40 Grove St.
Wellesley, MA 02181
(617) 235-0729List Price: \$199; 8087 Math
Module \$99; Sample Disk
\$10.Requires: 128K RAM (192K
RAM recommended), one disk
drive.

Any computer language faces the inevitable trade-off between execution speed and error-catching. Summit Software's Better BASIC comes down on the side of catching all the errors. It offsets the speed disadvantages with greater flexibility and a more open modular approach.

Summit's Better BASIC is divided into several programming modules: for example, statements used for color graphics are found in a 10512-byte GRAPHICS.IBM module, while those related to music are in 3120-byte PLAY.IBM module. Other modules based on key words are the CONSOLE, MAIN, MATH, FILE, EVENT, CHAIN, and SYSCALL modules. The supplied configuration file contains the names of these modules, and if you don't have a color graphics adapter, you can save some space simply by deleting the GRAPHICS.IBM module from the file.

The configuration file can also change the numeric precision between 4 and 24 decimal places (the default is 8) and to vary the stack and user-memory size, as in PC BASIC's CLEAR statement.

Summit's editor won't let a potential syntax error slip by unnoticed. For example, the

manual illustrates what happens when a closing parenthesis is forgotten:

```
40 PRINT (1+2*3
)" Expected
```

Apparently, each line is compiled as it is entered, and so you must immediately correct the error by moving the cursor back up to line 40 and adding the) to the end of the line. If you don't move the cursor quickly, the entire line vanishes.

You also can't introduce a variable that has not yet been defined or declared, as in line 20 below:

```
10 A = 3
20 C = A * B
```

Numeric Term
Expected

Line 10 is okay, since it defines the variable, A, so if you list the program, you'll see

```
REAL: A
10 A = 3
```

Type REAL: B and re-enter line 20 and then list again:

```
REAL: A, B, C
10 A = 3
20 C = A * B
```

Variable Meanings

In the same manner, other variables must be defined by entering un-numbered statements such as:

```
INTEGER ARRAY (9) : X
STRING: A$(25)
STRING
ARRAY (10) [16] : B$
```

The next time the program is listed, these lines will be seen at the head of the listing. The first

line is comparable to PC BASIC's DIM X(9), while the next line declares that AS is a string with a length of 25. The final line declares that each element in the B\$(0-10) array has a length of 16 as a default value.

Since AS has been declared as a simple string, there can be no array named AS(n) in the listing, as seen here:

```
STRING ARRAY (10) : AS
```

Symbol Already
Defined

As you can see from these examples, SST's Better BASIC is unfair to sloppy programmers, who must choose between getting their coding act together, or going back to PC BASIC. Working with Better BASIC's requirements can be a bit nerve-racking though: once you've declared that a string will have a certain length (or once the program assigns a default length of 16), there's no turning back. In the example seen above, space is set aside for a AS string of [25] characters, and you cannot change this number later on. About the only way to use a longer string is to declare a new string (for example, STRING: BS[50]) and then manually change each AS to BS throughout the listing. (The RE-NAME command doesn't seem to be able to handle this.)

Lots of Memory

As an enticement to sticking with it, I noticed a cheery little message as soon as I installed Better BASIC: At the top of my screen it said "LEFT: 153232 Bytes"! Probing a bit further, it turns out that your total program may be subdivided into two or more procedures, each of which is stored separately with its own set of line numbers. If you get really ambitious, your procedures can use all the available memory, instead of just 64K.

You could write a subroutine to do something under the PROCEDURE:SOMETHING label. Then, in the main program, you could write the following:

```
100 'This is part of
the main program.
110 SOMETHING
120 'The main program
continues from here.
```

At line 110, program execution branches to the SOMETHING procedure (which might also be numbered 100...110...120, and so on) and then returns to the main program.

Although variables are carried back and forth between procedures, you can CLEAR(A,C,D\$) to wipe out only those variables named within the parentheses. Previous variables are not cleared when a program is rerun, so a CLEAR command is needed at the head of the main program to avoid continuing from where the previous program execution left off.

If you've written a new program under Better BASIC, the SAVE command writes it to disk in binary object-code format, after which it may be quickly reloaded and run. If you decide to write it to disk as an ASCII file (by typing LIST <FILENAME>.), the program is recompiled before it runs the next time it is loaded. Of course, you can also strip such a program of its unique Better BASIC labels if you want to run it under PC BASIC.

BASIC Changes

Programs written in other BASICs must be saved as ASCII files in order to be loaded into Better BASIC. Needless to say, some changes will need to be made: NEXT can not be followed by a variable name, PRINT TAB(n) USING doesn't work, and a few key words have slightly different to very different meanings. Until you get used to it, conversion can be a bit of a chore.

Error lines are simply tossed out and don't appear in the loaded/compiled listing. You must make a note of them as the error (continued on next page)

BASIC (continued)

messages flash by and then re-enter each line in its entirety, or exit Better BASIC and go back to the original program to do the repair work.

I couldn't figure out how to get Better BASIC to switch back and forth between color and monochrome screens. Attempting to run a color program on the green screen, I got an "Error 803 in line 10" message. Although there's an appendix of error messages, Error 803 is not in it.

While fooling around with various other screen-switching routines, I almost achieved a screen switch, but I crash landed and locked up the system.

After switching over to the color monitor manually, I ran a converted version of the graphics demo used in the last issue to compare PC BASIC (24 seconds) and Morgan BASIC (25 seconds). Better BASIC comes in a distant third, at 48 seconds. However, on a simpler program that draws and fills a circle by calculating a series of coordinates—using the LINE command instead of the CIRCLE statement, Better BASIC finishes second behind PC BASIC. On a math-only program, Better BASIC is faster and even more accurate than Morgan, though not as fast (or inaccurate) as PC BASIC is.

Manual Dexterity

Fortunately, Better BASIC's manual describes every statement, function, command, and procedure in detail, so you're not forced to keep two manuals. However, the manual contains little in the way of supplemental information. Its index is of marginal value; the first 6 pages are simply an alphabetical listing of all the key words that appear in the "Syntax Visuals" section. But the key words are already in alphabetical order in the section, so you hardly need an index to find them. That listing is followed by a 2-page "Browser's Index" in which *module* is found under "Creating a Module", and *remarks* is entered under "Adding Remarks...."

The "Conversion Hints" appendix explains most but not all differences between Better and

COMPARISON CHART

Program Features	Summit Better BASIC	Microsoft PC BASIC
Comparison Chart		
Program Size (bytes)	133,924	25,984 (BASICA, Version 2.0) 26,880 (BASICA, Version 3.0)
Minimum Memory Required	128K	48K
Space Remaining (in a 320K System)	153,232	60,865
Programs Saved as	ASCII File or object code	ASCII file or compressed-binary
Simple Bubble-Sort	405 ASCII	314 ASCII
Program Saved in (bytes)	871 object code	237 compressed-binary
Directly Compatible with PC BASIC	No	N/A
Extended ASCII (128-255)	Yes	Yes
Line Numbers	Required	Required
Labels	Yes	No
Dynamic Syntax Checking	Yes	No
PC BASIC Keywords	148	180
Additional keywords	Many	None
Dynamic String Length	No	Yes
Maximum String Length	32767	255

Numeric Data (ranges)

Line Numbers	1-32767 (see text)	0-65529
Integer	- 32768 / + 32767	- 32768 / + 32767
Real Numbers	(claimed) 0.1E-254 / 9.99E+253 0.01 * 10E-253 / 1.00 * 10E+254 (observed) 1.00E-254 / 9.99E+253	2.934E-39 / 1.70E+38 or 2.934D-39 / 1.70D+38

(Note: Precision can be set for 4 to 24 digits. Last digit is rounded.)

542859.9114 on HP41 =	542859.91	542860
Decimal Accuracy	Absolute	Poor
Single-Precision Accuracy	(See above note)	6 (7th digit may be incorrect)

Execution Speed Comparisons (in min:sec)

Bubble-Sort of 50	1:12	1:25
Random Numbers		
Graphics Demo	0:48	0:24
Draw and Paint One Circle	0:14	0:09
Math Loop	0:14	0:04
Screen-Switching	(Procedure not documented)	Yes

Documentation

Content	Adequate	Good
Clarity of Presentation	Poor	Poor
Physical Appearance	Adequate	Very Good
Index	Poor	Good
Slip-Case for Manual	Yes	Yes

Microsoft BASIC. There's also at least one "hint" here that will confuse the beginner. This section suggests that a name variable cannot be used in a FOR...NEXT loop. Actually, the name must be used after FOR, but

must not appear after NEXT.

By the way, Summit's Better BASIC vocabulary is considerably larger (by about 50 words) than Microsoft BASIC's.

Better BASIC is a tough act to follow, because it offers the

serious programmers the best of two worlds. The "incremental compiler" won't put up with syntax errors nor with lapses in programming style that can come back to haunt you under other BASICs. ■

It's only logical to do-it-yourself and save

10 or 20^{MB} HARD DISK SYSTEMS

totally designed with the IBM PC in mind

- Volume purchasing guarantees low prices
- Statewide technical support team
- Warranty on disk and controllers

- Volume leasing program
- Service contracts available
- Dealer inquiries invited

\$599

**10 MB
HARD DISK
KIT** REG 895



\$895

**20 MB
HARD DISK
KIT** REG 1295

• 20MB HALF HEIGHT
DISK KIT
LIST 1295

• 10MB HALF HEIGHT
DISK KIT
LIST 995

• 10MB EXTERNAL
DISK SUBSYSTEM
LIST 1295

• 30MB EXTERNAL
DISK SUBSYSTEM
LIST 2495

• 10MB TAPE CARTRIDGE
BACK-UP KIT
LIST 795

• 45/60MB INTERNAL
BACK-UP TAPE KIT
LIST 1195

• 45/60MB EXTERNAL
BACK-UP TAPE DRIVE
SUBSYSTEM
LIST 1395

• 10MB REMOVABLE
CARTRIDGE KIT
LIST 1495

\$995

\$649

\$895

\$1895

\$595

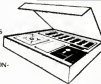
\$895

\$1195

\$1295

INTERNAL HARD DISK PRE-PACKAGED AND TESTED INSTALL-IT- YOURSELF

- VERY LOW POWER
- BOOTS DOS FROM DISK
- ALL NECESSARY CABLES
- INSTALLATION MANUALS
- BOOT SOFTWARE
- FULL & HALF HT. BEZELS
- MOUNTING HARDWARE
- 1 YEAR WARRANTY ON CONTROLLER & DISK



- ADD IN DRIVES FOR IBM AT
24MB 30MS 1995
43MB 30MS 2195
67MB 30MS 2495
- 360K FLOPPIES 145
- ADD IN POWER SUPPLY 135W 195
- ADD ON POWER SUPPLY 70W 165

**SPECIAL
IBM AT'S**

**CALL
FOR
ESTIMATES
PLEASE**

\$895 UPGRADED IBM PCs, XT's

CALL FOR EXCITING PRICING

Configurations include combinations of:

- 256K Memory
- Orchid Tech Boards
- 360K Floppies
- Removable Tape
- 10 and 20 MB Hard Disks



IBM PC, XT and AT's

TOLL 1-800-882-8311
FREE: 1-800-553-7800
IL: (312) 932-0890

All prices subject to change

ADD IN FOR CREDIT CARD USE



IBM is a trademark of IBM Corp.
Epson is a trademark of Epson America Corp.
Cognio is a trademark of Cognio Systems



STATEWIDE

MICROELECTRONICS, INCORPORATED

10 East 22nd Street, Lombard, IL 60148

Pre-installed software and manuals. Extra for installation services. For fastest delivery
order by 11:00 AM in Central Time. Payment within 10 days or cash. 4% discount with 15%
sales tax. Conspicuous or restrictive call for purchase order details.

CIRCLE 536 ON READER SERVICE CARD

PC Update



BY TOM BADGETT

I once worked for a company that was completely unable to plot a course and follow it. Goals and methods changed faster than we could learn them. During one stormy staff meeting, the CEO dismissed our frustration with the admonition, "Our consistency is in our inconsistency."

In the computer industry, the watchword is change. The only consistency is chronic inconsistency. The system purchaser is shrouded in specifications; the computer owner is frustrated following new releases and system updates.

Just look at recent developments in word processing. One recent study shows that word processing has outdistanced spreadsheets and other software in popularity among micro owners. And the dozens of popular word processor producers regularly release improved versions of their software.

MicroPro (33 San Pablo Ave., San Rafael, CA 94903) is getting a lot of attention with *WordStar 2000 Plus*, a completely rewritten version of the venerable *WordStar*. *WordStar 2000* is bigger and better, all right. It has the features most users covet, has more menus and better help, uses sensible mnemonic keyboard commands—and it takes up four times as much memory as the original did. If you're already using *WordStar*, the new com-

mand structure will drive you crazy. Old files aren't compatible with the 2000 software unless you run them through a conversion routine. New purchasers will pay \$595 for the full-featured *Plus* version. You can upgrade your old *WordStar* for \$250.

Should *WordStar 2000 Plus* be your word processor? Perhaps. It has all the features anybody will ever need. It's competitively priced. It's fairly easy to learn. On the other hand, it's a new product. It lacks *WordStar*'s millions of hours of field testing. It needs extra memory. And, even with promised discounts, it still costs considerably more than original *WordStar*. Moreover, if you don't need another communications package, tables of contents, or *MailMerge*, you're paying for unnecessary features.

Star Polish

Consider this: TDI Systems (620 Hungerford Rd., Rockville, MD 20850) has announced a new version of *Star Polish*, a software overlay to enhance *WordStar*. For \$125 you can add help menus and see underlining, boldface, italics, and other special print effects on-screen. *Star Polish* uses the PC's function keys, and the new version works with color/graphics or monochrome displays.

There's also a new *WordPerfect*, the Satellite Software package many IBM dealers swear by and recommend regularly. Version 4.0 reportedly offers improved footnoting, tables of contents, indexing, paragraph numbering, word count, a 100,000-word dictionary with automatic correction, and improved documentation. SSI (288 W. Center St., Orem, UT 84057) will switch you from *WordStar* to *WordPerfect* for \$250 and your *WordStar* disk.

The Proximity Technology (3511 N.E. 22nd Ave., Ft. Lauderdale, FL 33308) 50,000-word dictionary is now available on ROM for use in type-

writers, computers, or other office products. This is the dictionary already used in *MultiMate*, *EasyWriter*, *Samna Word III*, and other word processing and typesetting systems.

Speaking of *Samna Word III*, we are still looking for the latest version of *Samna Plus*, an inte-

grated package from Samna Corporation (2700 N.E. Expressway, Atlanta, GA 30345) that should be out by the time you read this. Preliminary demos show some innovative features.

PC News welcomes Tom Badgett's PC Update as a regular column.

H-P with Printer and Unix-To-Go

SAN DIEGO—Hewlett-Packard's newest computer is far from being IBM PC-compatible, but it's rare to see a new system so innovatively different from IBM's. The *Integral PC* is a 25-pound transportable computer based on the Motorola 68000 processor (operating at 8 MHz) and H-P's version of the UNIX operating system. Its list price is \$4,995.

The unit includes a built-in 9-inch amber-colored flat-panel electroluminescent display screen (similar to that used in the *Grid* portable computer) with 512 x 255 pixel resolution, a 3½-inch disk drive that holds 710K, an H-P ThinkJet printer, 512K of user RAM, and an additional 32K RAM dedicated to the display. All these items fit into the *Integral PC*'s 13 x 7 x 16-inch case. The



system won't run on batteries, however, because its very readable screen demands too much power.

The UNIX operating system kernel software is part of the machine's 256K of built-in ROM. (The ROM board is easily replaced for software upgrades.) This approach eliminates the need for a hard disk to run UNIX. The version of UNIX used here is HP-UX, which is also available on H-P's 9000-family of engineering workstations, superminis, and supermini computers. The computer's ROM also includes a window manager, *HP Windows*, and the Personal Applications Manager (PAM), an access shell that replaces standard UNIX commands. A similar PAM shell came with H-P's MS-DOS-based Touchscreen and Portable personal computers. (A mouse to use with this window-oriented shell is available separately.)

—James Langdell

Just a Few Reasons We're Number One.

When you're figuring which tax software investment will give you the greatest return, consider this. More people buy HowardSoft's Tax Preparer for their IBM-PC, T1 Pro, or Apple Computer than any other tax package around. Now, if that's not reason enough to choose HowardSoft for yourself, here are just a few more.

It's easy.

HowardSoft's clear instructions walk you through the program and simply detail the most-used forms and schedules.

It's accurate.

With your tax form right on the screen, you enter information just once. Tax Preparer calculates quickly and accurately, makes changes automatically, and even re-checks for consistency throughout your return. It delivers IRS-accepted printouts, error-free and ready to mail.

It works hard.

Tax Preparer keeps records completely perfect order projections round.

your on-going accessible, in and ready for all year-

It's reasonable.

HowardSoft's years of experience with tax related software really pay off. You get the features of high priced packages at a fraction of the cost. Plus inexpensive updates for easy filing year after year.

It's unique.

No other software does so much. Tax Preparer provides 21 separate IRS forms and schedules. It gives you unlimited itemizing, word-processor-type editing, and help messages at the touch of a key. And it even has a built-in tax planner for projecting the future.

You can call or write for even more details than these. When you have all the facts it all adds up. There really is no reason to buy any other tax package than Tax Preparer by HowardSoft.

HowardSoft.TM The software investment you can count on.

8008 Girard Avenue, Suite 310
La Jolla, CA 92037 (619) 454-0121

CIRCLE 327 ON READER SERVICE CARD



IBM PC is a trademark of International Business Machines Corporation. Apple and Macintosh are trademarks of Apple Computer, Inc.

PRODUCT REVIEW

Higgins: A Top Desk Organizer

BY CRAIG L. STARK

Higgins

Conetic Systems, Inc.
1800 Southwest First Ave.,
#180
Portland, OR 97201
(503) 227-0645
List Price: \$395
Requires: 256K, DOS 2.x.

PORTLAND, Ore.—Can a software program be so good you're better off without it? If there is an award for such an anomaly, it should probably go to *Higgins*, the new \$395 desk management package from Conetic Systems, Inc. You can come to rely on it so heavily that your dependence on a single fragile, copy-protected disk could be dangerous.

More than a notepad, phone dialer, calendar, expense recorder, and calculator, *Higgins* integrates all these functions into a single "administrative assistant." If your daily log shows a luncheon appointment with a steamfitter named Psmith, *Higgins* will not only find his number and call to confirm, but will remind you to inquire whether his wife Susan's sciatica is any better.

Before you go to dine, *Higgins* will serve up all your notes on Project Poppet-valve for review and will put you in touch with the fellow you've got checking out Psmith's bank references. After lunch, *Higgins* will tote up all your expenses by whatever categories your employer insists on, and will even let you note the third martini without putting it in your current expense report. An additional To-Do list helps you keep track of other prioritized obligations, all cross-referenced to the various people, expenses, and projects you have entered in *Higgins*'s unfailing memory.

In short, *Higgins* is a kind of

information you want. Keywords can also tag external disk files, such as those produced by your normal spreadsheet or word processing programs.

Each of *Higgins*'s familiar functions is thoroughly implemented. The calculator, for example, is not just the usual four-banger, but has ten memories, exponentiation and percentage functions, and selectable 0- to



Higgins is a personalized database that uses multi-window display functions.

personalized executive's database, into which the usual "electronic desk" organizing functions have been integrated using a multiple-window display. You choose key words that you can couple by logical ANDs and ORs to extract the precise

6-decimal or floating-point precision. (It does not, however, do hex and binary conversions.) The notepad is a more-than-adequate little word processor with insert/overwrite, word wrap, window expansion, and other useful features.

Pulling Widgets Out of a Black Box

Sometimes, the right product name is all you need to cash in on a market that already exists. A dozen years ago, at a college party, I was sent out to "pick up some munchies." When I got to a grocery store, I was delighted to find some corn chips packaged under that very name—Munchies. Of course, I bought several bags in order to have the satisfaction of announcing on my return, "You wanted Munchies? Well, here they are!"

What a marketing masterpiece! The name alone made me buy the product—and I don't even like corn chips!

Micom Systems, Inc., has a similar genius for brand names. How often have you heard or said this expression? "Think of this device as a 'black box'—don't worry about anything but its input and output." Well, Micom made the most of that expression by creating a mail-order division to sell computer cables, connectors, interfaces, and switching boxes—all under the name Black Box.

That ready-made name proved so successful that Micom seized on another popular expression to create another division: Widget World. Now when engineers say, "Get me a widget to fix this," buyers can take them literally and give one of Micom's Widget World dealers a call.

To receive a Black Box catalog, write to Black Box Corp., Box 12800, Pittsburgh, PA 15241; to find your nearest Widget World dealer, call Micom at (213) 998-8844.

—James Langdell

The desk calendar sports selected highlighting, an alarm clock, and even a stopwatch for billable client time. Even the tutorial program and printed documentation are exemplary. Once loaded, *Higgins* remains on call even when you leave "him" to run external programs. For the security-conscious, *Higgins* can recognize separate public and private passwords in addition to user identification, and a keystroke hides the current display from a visitor.

Ambling Along

One price to be paid for *Higgins*'s thoroughness, however, is speed. While some desk managers leap into action, *Higgins* ambles from screen to screen at the leisurely pace of a faithful old servant. Moreover, even when you just need to note a 2:00 press conference, *Higgins* will try to lead you through a series of a dozen or so menu choices (What time? Want an alarm to sound? Event description? Public or private? Any directory relevance? Put on the To-Do list? Expense account? Associated project?).

You can skip over most of the inquiries, but command-oriented software users will quickly find themselves menu-driven to distraction. However, if you want full, relationally callable records of your business and activities, you must be willing to key in the data for them, and for this, *Higgins* provides a superb framework.

The fatal flaw in the program is simply that because *Higgins* quickly comes to contain everything about the daily operation of your business, if "he" ever gets sick, you're sunk. The program requires the insertion of a "key disk" in drive A: to boot, and if that single, heavily copy-protected disk ceases to work, you can't either. Conetic supplies no 1-2-3 like system backup disk, and no *Wordstar* 2000-like arrangement to allow creation of even a single master back-up. The best Conetic Systems would do in response to repeated inquiries, was to promise (verbally) to send buyers a single back-up key disk if they returned their signed license agreements. ■

Four score and seven years ago our fathers brought forth, upon this continent, a new nation, conceived in liberty, and dedicated to the proposition that "all men are created equal."



The picture in this ad is actually an 18" by 24" collector's item—an originally commissioned museum-quality print. This month, the Gettysburg print is yours, absolutely free, at most computer stores that carry Leading Edge Word Processing.

For the name of the dealer nearest you, give us a call at 1-800-343-3436, (617) 449-4655.



LEADING EDGE™

LEADING EDGE PRODUCTS, INC.
SOFTWARE DIVISION
21 HIGHLAND CIRCLE
NEEDHAM HEIGHTS, MA 02464

WORD PROCESSORS AT THE LEADING EDGE

Ah, the great ones...

They organized their ideas, their intuitions, their idioms. They set them down, sorted them out, arranged them and re-arranged them till they came out right.

They used small scraps of paper to record huge hunks of Truth; primitive tools to produce profound prose. But when the words finally went forth, they

made indelible marks on all who read them.

The amazing thing is that these monumental processors of words, did it without the benefit of monumental help.

Like Leading Edge Word Processing: the easiest to use, yet most potent piece of software ever created to take full advantage of all the power inherent, but until now un-tapped, in today's

most sophisticated personal computer. (Like the IBM® PC, and the even faster and more powerful Leading Edge™ & AT&T.)

The heart and soul of it is a 5 1/4" floppy disk, elegantly logical instruction manual and documentation... everything. And what you end up with is word processing at the leading edge.

LEADING EDGE™ WORD PROCESSING FROM \$100

IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES CORPORATION
LEADING EDGE IS A TRADEMARK OF LEADING EDGE PRODUCTS, INCORPORATED

CIRCLE 280 ON READER SERVICE CARD

"My IBM® PC XT® writes monthly billings and statements to Maxwell & Sons' 1,893 customers, and tells me who owes what."

When you work with a lot of information, you can't afford to re-enter every file when your hard disk fails. And no hard disk is fail-safe.



"My Sysgen Image® backs up the whole lot in less than five minutes. 10 megabytes on a single cassette..."

The Sysgen Image backs up the hard disk in your IBM PC XT. So you can protect your files in minutes—instead of spending hours re-entering them.



"For just \$995. That's cheap insurance. It lets me sleep at night."

The Sysgen Image for just \$995. It's the most affordable insurance you can buy for your two most important assets: Your information. And your time.



Sysgen. Because a hard disk without tape just doesn't make sense.

Sysgen products for the IBM® PC, PC XT, and other personal computers: Economical, 10- and 20-Megabyte hard disk systems with tape back-up. Or 10-Megabyte

tape back-up for the IBM PC XT.

Go to your local computer dealer. Ask for a demonstration of Sysgen back-up systems. And find out how to make sense of your storage.

47853 Warm Springs Blvd., Fremont, CA 94539
(415) 490-6770 Telex 4990843

SYSGEN
INCORPORATED

IBM is a registered trademark and PC XT is a trademark of International Business Machines Corporation. Sysgen Image is a trademark of Sysgen, Incorporated.

People in the News: Robert Markell

IBM's vice-president of software developing and publishing takes time to speak out.

BY JOHN DICKINSON

BOCA RATON, Fla.—The office is the size and type you would expect a successful IBM executive to have. So are the desk and furniture, including a comfortable couch and chair set.

But the contents may not be what you'd expect. The latest issues of *PC Magazine*, *PC Week*, *Creative Computing*, and



Robert Markell

a host of other microcomputer publications cover the desk; the bookcases are filled with an uncountable number of 6 x 9 boxes containing software for the XT with expansion unit that is powered-up and running on the credenza.

And its occupant, Bob Markell, isn't exactly who you'd expect, either. "I wish they'd let me have an AT," he says, pointing to his two full Winchester disks. "But there aren't enough ATs to go around, so only the development programmers have them."

Hands On

Markell is in charge of those programmers and, for that matter, all development and publication of PC software carrying the IBM logo. That includes programs developed internally at IBM's Entry Systems Division (ESD), in which he's a vice-president, and the Information Systems Products Division, which developed the

Personal Decision Series and Business Management Series software, as well as software developed for IBM by third parties, including the operating systems created by Microsoft.

If Bob Markell had an AT, it would probably have the optional second Winchester disk installed, and it wouldn't be there just for looks. He personally tries out every software product IBM publishes, and gets involved with every aspect of the product, starting with its design, through development and testing, and on into production and enhancements.

He Hears You

"I like to listen to people and find out what they want in a product," said Markell. He says, "I like to listen," often. Markell is a strong believer in the theory that a computer is only as useful to somebody as what it can do, and he wants to be sure IBM's software products do what people need them to do. "If it's not doing the job, we've got to fix it."

IBM did not attain its leading position by building computer products that didn't do what people wanted them to do, and Bob Markell has been part of that process for the last 17 years. Most of his background is in IBM's mainframe systems, starting with his first IBM assignment as part of the OS/360 design team. Markell moved from the design team into the test and service organizations created by IBM to support its flagship mainframe operating system, and over the years has held a number of senior technical management jobs surrounding the MVS operating system, which evolved from the OS/360.

Markell arrived at Boca Raton a year ago to take over as ESD's vice-president of Software Development and Publish-

ing, and he brought his mainframe background with him. Despite what you might think, that's not bad news for PC users—not bad at all.

"We have to focus our software products so people understand how to get the most productivity out of them," says Markell. Focusing software products means helping people organize how they think about them, and Markell's mainframe and technical backgrounds come through when he talks about it. Software, he explains, can operate at one of three levels. The basic operating system of the computer, such as PC-DOS and the PC BIOS system, is at the lowest level. At the next level are systems extensions, and at the highest level are the applications themselves.

Levelling with Us

"You have to develop products at all three levels to give users the most out of their computers," claims Markell. "Topview, for example, is a systems extension. It extends the capabilities of PC-DOS, but it doesn't have to be used to run the system." He likens Topview to VSAM, a personal favorite of his, which strengthens MVS, but is not required to run MVS programs.

Markell's highest priority is making sure IBM provides users with the software they need to get the most out of their personal computers. His attitude about how IBM should go about doing that reflects the Entry Systems Division's open approach to hardware and software development and not his own mainframe and technical background.

"We plan to continue multi-sourcing everything, including the PC's operating systems, extensions and applications," says Markell. He explained that third parties can include other IBM

divisions (a recent trend), but can also "include almost anybody." When asked why IBM hadn't yet developed its own proprietary operating system for the PC, Markell responded that IBM's success at marketing third-party software elsewhere spoke for itself.

In the dense fog of IBM rumors that always clouds the air, the one that seems to have piqued everyone's interest in the past year is the supposed "rift" between IBM and Microsoft. When I asked Markell about it, he paused and gave me one of his most incredulous looks before asking me, "You don't mean Bill [Gates], do you?"

Clearing the Air

"Look," he continued, "Microsoft has been a tremendous help to us from the start of this thing [the PC], and we have absolutely no intention of changing that." According to Markell there is no motivation for IBM to do anything but continue its relationship with Microsoft.

IBM is more motivated by the task of staying current with PC users and their requirements. He cites IBM's introduction of Microsoft's XENIX operating system as an example, saying, "Everything I hear and read says there's a strong interest among a certain class of users in a UNIX-based operating system for the PC. We think we've provided a first-rate product to fulfill that need."

In a surprisingly candid remark, he added, "There is a real need to break through the PC's 640K [memory] barrier. XENIX provides one way to do that on the AT, and as soon as it's technically possible, we'll release other ways to break through." Markell declined to be more specific, but the message was clear enough.

"Remember," he said, "I like to listen."

HOW TO BUY SOFTWARE WHEN ALL THE ADS LOOK THE SAME.

We know it's hard to choose a software house. All the ads say the same thing—"Lowest prices," "fastest delivery," "best support," "biggest inventory."

Trouble is, although the claims are the same, the companies are very different. Which is why we want you to know some important facts about us:

1. 800-SOFTWARE is one of the oldest and most reputable firms in the industry. Our customers include IBM, GE, Hewlett-Packard, Xerox, AT&T, and thousands of other satisfied buyers.

2. Our National Accounts Program offers volume discounts and valuable services to large software users. We offer *incredibly* low prices on large bids!

3. We have a giant, \$1,000,000 inventory. Which means we can offer next-day delivery if needed.

4. With every product you get friendly, expert technical support. Have a question? You'll be glad you bought from 800-SOFTWARE!

5. We'll match our competitors' prices on most products. We *never* cut service.

6. We never charge extra for credit card purchases, nor do we process for payment until the product is shipped. (Our competitors don't make this claim!)

7. You'll automatically receive our Technical Support Newsletter—a great way to stay up-to-date.

8. We are members of the Better Business Bureau and the Direct Marketing Association.

9. We want your business. *And* your repeat business. Which is why we work so hard to keep you happy. Give us a call and let us *prove* it!

CHECK OUT ALL OUR INCREDIBLE PRICES:

Lotus 1-2-3 \$295	dBase III/III \$259/\$349	Framework \$349	WordStar 2000/2000 Plus CALL
Lotus Symphony \$425	CrossTalk \$95	SuperCalc 3 \$195	Norway Smartmodems 1200/1200B \$459/\$399
SOFTWARE			
ABORT-TATE™		TellMerge \$ 80	HARDWARE, ETC
dBase III/III \$259/\$349		All Other Products CALL	AMDEK™ Monitors CALL
Framework \$349		MICROSYM™ \$125	ART™ Products CALL
Friday! \$219		Riteau 4000 \$250	ATI™ & COEX™ TRAINING CALL
DIGITAL RESEARCH™		MICROSOFT® \$125	EPSON® PRINTERS NEW LOW PRICES!
FOX & GELLES™		Multiplan \$125	BATES™ \$125
INM™		Word in Motion \$250	Smartmodems 1200/1200B \$459/\$399
4 Point Graphics \$ 80		Fortress \$250	NEC/SCULPT™ \$190
PC Paintbrush \$ 80		All Other Products CALL	Color Card \$325
LIFEGUARD LATTICE C-COMPILER™		MICROSOFT® CrossTalk \$ 95	Graphic Card \$325
LIFETREE™		MULTIMATE™ \$255	IBM®
Volkswagen Deluxe \$179		ROSESOFT™ Pro Say \$ 90	Computers and Other Products NEW LOW PRICES!
LOTUS™		SOFTWARE PUBLISHERS™	MAXELL™ 5.25" DISKETTES CALL
1-2-3 \$295		PFS File/Graph/Write \$ 84	BOSTON 8 UTILITIES™ \$ 50
Symphony \$425		PFS Report \$ 75	ORIGATA™ PRINTERS NEW LOW PRICES!
MICROPRO®		BORCING™ \$150/\$190	PRINCELOTOR GRAPHICS™ MONITORS CALL
WordStar 2000/2000 Plus CALL		SuperCalc 3.0 \$195	ORIGAM™ \$190
WordStar Pro Package/P.P. Plus \$259/\$350		Easy Writer II System \$180	WESTERN UNION EASY LINE® FREE
InfoStar CALL		US Easy Business Accounting \$299/300	
CherStar \$230		All Other Products CALL	

WE ALSO CARRY HUNDREDS OF OTHER PRODUCTS!

800-SOFTWARE

To order call toll-free:

800-227-4587 or 415-644-3611

CIRCLE 230 ON READER SERVICE CARD

- ☐ Dealer inquiries welcome.
- ☐ Quantity discounts available through our National Accounts Program.
- ☐ Purchase orders accepted. Please call us in advance.
- ☐ Call for shipping charges. Overnight delivery available.
- ☐ We do not add surcharge for credit card purchases.
- ☐ Prices may change. Above prices are for IBM PC and compatibles.
- ☐ International orders welcome.
- ☐ TELEX #711743 800 SOFTWARE UD.

800-SOFTWARE, INC.
940 Dwight Way
Berkeley, CA 94710

Bell & Howell Launches New Graphics System

BY DON KENNEDY

Business Graphics System

Bell & Howell Co.
7100 McCormick Rd.
Chicago, IL 60645
(312) 673-3300

List price: \$7,500 for the Color Digital Imager IV, \$1,200 for the *Graphics Express Software*, \$2,000 for the optional high-resolution monitor and graphics tablet.

Requires: 320K RAM, one serial RS-232C port (two for the graphics tablet), monochrome adapter/monitor and color graphics adapter/monitor (the high-resolution monitor can be substituted for one of the adapter/monitors), optional 8087 math coprocessor.

NEW YORK—If one picture is worth a thousand words, Bell & Howell is hoping that many businesses will figure a whole slide show is worth about



Donald N. Frey

\$11,000. That's the pricetag for its new Business Graphics System, a combination of hardware and software that works with PCs and compatibles to produce top-quality slides, transparencies, and printed presentation graphics.

The Business Graphics Sys-

tem is made up of a color digital imager, graphics software, and an optional high-resolution monitor and graphics tablet. The heart of the system is the Color Digital Imager IV, an intelligent imaging device that enhances the PC's visual output. Bell & Howell officials claim that the imager produces up to eight times more resolution than the color output available from most personal computers. In addition, the digital imager offers a range of 4,096 colors, with 16 displayable at a time.

The 35-pound Color Digital Imager IV comes equipped with two cameras. A motor-driven Minolta 35mm with frame counter and battery eliminator can be used to produce slides with either Ektachrome 100 film or Polaroid CS40, Polaroid's instant slide film. A Polaroid 3½- by 4½-inch flat-pack film back can be used for instant prints. A precision multi-element lens is included with each back.

The digital imager accepts input from I-2-3 and drivers for Graphic Software Systems' *Virtual Device Interface* and ISSCO's *Tell-A-Graf* in addition to Bell & Howell's own *Graphics Express Software*. Bell & Howell officials say that 40 to 80 slides can be prepared in an hour.

Graphics Express

The *Graphics Express Software* is an open-architecture program requiring 320K RAM and DOS 2.x. It features numerous bars, lines, and pies for charts, three forms of text, and nine different font styles that come in different sizes, thicknesses, and angles. Because of its device independence, the

system supports not only Bell & Howell's Color Digital Imager IV but the Matrix PCR and QCR, as well as other monitors and tablets. It also supports numerous printers and plotters that can create hard copy or transparencies that can be used on an overhead projector.

The optional graphics tablet is the Calcomp 2000, but the system also supports others. According to Bell & Howell officials, the high-resolution Mitsubishi color monitor has an 832x630 resolution and enables users to preview exactly how the graphics will look on the slide or print out, eliminating the jaggedness and poor color fidelity of standard computer monitors.

Although a math coprocessor is not required, company officials pointed out that it speeds the creation of fonts in the picture system and significantly speeds the actual process of capturing the image.

Bell & Howell

78-year-old Bell & Howell is best known for manufacturing movie cameras and projectors. It has diversified significantly, but few companies are as keenly aware of the market for a graphics system that can give you complete control over a visual presentation without risking confidentiality.

This market is not small potatoes, either. Bell & Howell officials estimate that over 2 billion slides were produced for American businesses last year. As Bell & Howell's chairman and CEO Donald N. Frey said, "What we used to do is not so much different from what we do now—except the technology is different."



Bell & Howell's Business Graphics System is made up of a color digital imager, graphics software, and an optional high-resolution monitor and graphics tablet.

How to Make Your Own PC News

If you know any news, gossip, jokes, or unusual computer tales that make you say, "Gosh! That ought to be in PC News," please tell us. We'll pay up to \$50 for each submission we use. You must include your name, address, and phone number—and a social security number so we can pay you. We will, if you wish, preserve your anonymity. All submissions become the property of *PC Magazine*.

Please send your stories and tips to *PC News*, *PC Magazine*, One Park Ave., New York, NY 10016, or through your computer to Source BBB343 or MCI Mail 157-9301.

PC-Communiqués



Apple's Moonlight Drive

Apple's "Test drive a Macintosh" campaign strikes us as a great—and gutsy—way to let people find what use they can make of personal computers. In case you hadn't heard, participating Apple dealers will let you take a Macintosh and six software packages home overnight.

So far, it's a popular offer. We hear that the shrewdest customers reserve the Mac for Saturday night so they'll get to play with it all day Sunday while the store is closed. Perhaps a company might abuse Apple's deal by sending its employees around to several Apple dealers; with careful scheduling they could keep the office stocked with a free computer every working day.

I wish IBM would come up with an equally effective way for curious customers to try out its PCs. I'm a little embarrassed when I see IBM's "hands on" rooms at computer fairs. There's about a dozen machines, mainly PCs, each loaded with a single program—usually a cheap game. IBM's representatives stand around in blue suits, looking like playground monitors. Will this convince people to spend thousands of dollars to do more of the same at home?

People should be able to take Big Blue's systems out for a spin, too. If nothing else, this would prove that IBM com-

puters aren't quite as difficult to learn as Apple's ads claim.

IBM was evidently impressed by the effectiveness of Apple's commercial, which compares a heavy stack of IBM PC manuals with the Macintosh's slim instruction booklet. The IBM Credit Corporation ran a look-alike ad in *Fortune* recently, setting an intimidating 2-inch-thick financing document next to IBM's new single-sheet master agreement form. "What's missing?...Unnecessary work," the credit division's ad contends.

Obviously it's easier for IBM to copy Apple's style than to answer the Macintosh challenge directly. But IBM aficionados know that Apple still would be living dangerously if it posed the rhetorical question, "What's missing?" about its Macintosh. Many of the PC's extra pages explain things that can't be done with the Macintosh.

MicroPro's Rodent Processor

The only thing more difficult than inventing a palindrome is inventing a plausible explanation for it. Regular PC contributor Dean Hannotte came up with an elegant, PC-related sentence that reads the same forwards and backwards. Since it's not the sort of thing you'd find occasion to say more days of the week, I'll suggest a way to justify dropping Hannotte's polished gem into a conversation:

"I'm sure you've heard of debugging software. But did you know that a popular program can dispose of larger pests? Yes, it's true...
"RATS DROWN IN WORDSTAR."

Intuit's Price Finds Its Own Level—\$89.95

How much is an integrated software package worth? Most such products have prices between \$350 and \$700. But after using an auction-style experiment to introduce its *Intuit* software, Noumenon Corp., of Alameda, Calif., thinks it found the right answer—\$89.95 per package.

Intuit first came to the public's attention in July through a tiny news item in *PC Week* that reported the program's price was only \$50. Hesitant customers were warned, however, that Noumenon would increase the price by \$20 each week. The company's ads said, "By now, the price is going up."

Noumenon hoped that word of mouth among users would garner some direct orders of *Intuit*. At first, says the program's author, Martel Firing, "we hadn't expected an explosive reaction, but friends and relatives had to be here all night taking calls and packing boxes."

Prior to its experiment, Noumenon expected that *Intuit* would generate the most profit when its price was \$250. But sales dropped off sharply after the price rose above \$100. "At \$210," said Firing, "we'd gotten our signal. No one was buying our program anymore."

When the carnival atmosphere cleared, after sales to about 1,000 users, Noumenon analyzed prices, and decided the most effective everyday

price would be \$89.95. "That gives us a good return whether we sell it to users, dealers, or distributors," claims Firing.

Firing continues: "The low price surprised me, but I never believed in this industry's myths that software has to cost \$400 and that you need to spend millions on advertising to sell any of it. Those price-volume curves are goofy: The price of software hasn't really dropped since there were thousands of users, but now there are millions.

"The funny thing is we make money every week. But now a lot of those jokers who felt you needed millions just to start up are going down the tubes."

The Best and the Brightest

Fortune magazine named the IBM AT as one of the 12 most exciting products of 1984.

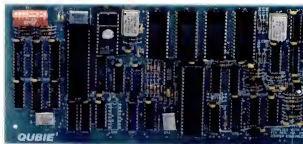
IBM's most powerful PC shares its glory with such high-tech marvels as Canon's laser printer, Rockwell International-



al's B-IB long-range bomber—and Apple's Macintosh computer. While IBM might consider it a dubious pleasure to share an award with its competitor, AT looks more out of place next to some other winners—LA beer, Free Hold Styling Mouse, and the GoBot.

—edited by James Langdell

Inside Outside



PC212A/1200 \$290
212A/1200E \$329

Why pay more for a 300/1200 baud modem than you have to? Through the use of four low-cost, state-of-the-art microprocessors, we can now offer two versions of our full featured modems at prices, hundreds less than the competition. PC212A/1200 is available for \$299, the 212A/1200E for \$329.

Our modems are fully compatible with all Hayes software commands. Software packages like Crosstalk™, Sidekick™ and SmartcomII™ will work with our modems.

Our internal modem card, PC212A/1200, is designed specifically for the IBM PC, PC/XT or other PC-compatible units.* The board occupies only one slot, since it is just 6/10" in thickness. The optional asynchronous port, available for \$40, can be used for other peripherals when the modem is not being used. The modem comes complete with PC-TALK III™, modular phone cable, card edge guide, and user's guide.

Our external standalone modem, 212A/1200E, can be used with any computer or terminal that has an RS-232C serial port. The modem is housed in an attractive gold anodized case and fits comfortably under a standard telephone.

An easily accessible volume control knob adjusts the modem speaker's output. The modem comes complete with modular phone cable, serial connector cable, and user's guide.

Both modems are Bell 103/212A compatible. Both feature auto-dial and can be accessed remotely through an auto-answer mode.

Good service starts with answering your questions before and after you buy. It continues with same or next day shipment of your order. Since we only sell a few selected products, we have the information and inventory to help you fast.

We perform repairs in our own service department within 48 hours, should you ever need service during the one year warranty period.

Our price is the whole price. All prices include UPS surface charges and insurance. In a hurry? Two day UPS air service is just \$8.

Corporations, dealers and institutions, call for volume purchase price information.

CIRCLE 356 ON READER SERVICE CARD

*Call for information.

No Risk Guarantee

If you are not completely satisfied with your purchase, you may return it within 30 days for a full refund, including the cost to send it back. If you can get any of our competitors to give you the same guarantee, buy both and return the one you don't like.

Order Today, Shipped Tomorrow!

For fastest delivery, send cashiers check, money order, or order by credit card. Personal checks, allow 15 days to clear. California residents, add 6% sales tax. Hours: Mon-Fri, 8:00 a.m.-6:00 p.m. PST Sat. 9:00 a.m.-1:00 p.m. PST

(800) 821-4479

Toll Free Outside California

(805) 987-9741

Inside California

QUBIE®

4909 Calle Alto
Camarillo, CA 93010

London (01) 223-4569

Paris (01) 321-5318

Sydney (02) 879-3322

© Qubie 1984

Down Time



BY WINN L. ROSCH

One day, it dawned on me. I hadn't so much shared my desktop with my PC as surrendered it. The system unit left little room for my file-by-the-pile system, and the beast's noise turned long-distance calls into guessing games. I had to do something to get peace, quiet, and work space.

Software engineer and friend Erich Ringwald of Tecmar opened my eyes and ears to the problem when he stuffed his PC under his desk and clipped one of the wires supplying the fan with electricity. Because he kept the lid off his machine (so he could easily shuffle expansion cards in and out), it never suffered a heat stroke.

I was reluctant to repeat his experiment because I did not want to take the cutters to my PC. I also didn't want to operate sans case because of the radio interference that leaks out of the machine. Even with my PC's case bolted in place, my favorite FM station's signal has trouble getting to my tuner because of the chortles and squeals the PC generates.

My solution was to stuff my desk-robbing, wind-machine PC—together with its whooshing chorus of expansion chassis and external hard disk drive—into a closet. Closing the door lowered the noise level to a tolerable level.

A closet installation has its own problems—it's difficult to

type through a closet door, hard to see the monitor, and troublesome to switch disks.

The Price of Silence

For me, the last problem was minor. Because I use a hard disk, I need only access a floppy drive slot about once a day. The keyboard and monitor problems were solved with simple extension cables.

Leaf through the pages of this magazine, and you'll find many organizations offering their own versions of keyboard and monitor extension cables. Their prices are reasonable (at least in a world where adding "computer" to any product description immediately doubles the price). If you're resourceful, however, you can make the required extensions for less than \$10.

Don't think IBM RGB and monochrome monitor cables are exotic and expensive just because they use strange 9-pin "D" connectors. Atari, Commodore, Sears, and Radio Shack joysticks use the same connections, and if you page through your Radio Shack catalog or wander through a local store, you'll find a 10-foot joystick extension cable for \$3.95 (catalog no. 276-1978). True trial-and-error empirical testing proved that the joystick extension will work just fine for either IBM RGB or monochrome monitors. Just plug 'em in.

I tried adding two, end-to-end to run the monochrome monitor on my desk, and this works so well that it has become the semipermanent arrangement of my system. Occasionally, the image "tears" a bit, so you might want to stick with only one extension cable.

Composite input color and monochrome monitors will work fine with most standard audio patch cords, which you can buy at a local store or swipe from your hi-fi system.

Although extension power cables for the IBM Monochrome Display may be tough to find, you can use a standard power cable to plug the

monitor's power cord into any wall outlet—the same way you connect your system unit.

I plug my whole PC system (one computer, two monitors, an expansion chassis, and a hard disk) into one switched outlet strip. A flick of the switch brings the whole system to life. (Be careful, however, because some hard disks require a special turn-on and turn-off order, and can fatally crash if it's not observed.)

Because I found no ready supply of keyboard extension cables—and no cables long enough for my needs (20 feet)—I chose to make my own.

It's not hard to do if you know which end of a soldering iron to hold. All it takes is four connections to each end of the cable. (Although the keyboard plug and jack have five pins, the PC uses only four of them.)

The choice of wire you use for keyboard extensions is critical. Do not use solid conductor wire. In a few flexes, the wire will break within its insulation and put you out of action.

When I tried standard telephone-to-wall cable, like that the PC/r uses for its keyboard, my standard PC keyboard would not work. However, an Advanced Input Devices keyboard (the same model that's

available from Display Telecommunications, Inc.) worked fine with the telephone-wire extension. The current-hungry PC keyboard sucks so much power that I measured a 2-volt drop (from 5 to 3) between the ends of the telephone cable.

To solve the problem, I went overboard and bought 20 feet of number 18, four-conductor, stranded wire, which still cost me under \$2. At Radio Shack, I bought male and female 5-pin DIN connectors (catalog nos. 274-003 and 274-006) for \$1.49 each. In 15 minutes, I had soldered together a keyboard extension, and it worked like a charm. Even though I used unsheathed wire, I detected no increase in interference in my FM radio over what my stock PC generated.

When I was finished, my desktop clutter was reduced (by about 5 percent—clutter always expands to fill whatever space is available). My hearing is beginning to come back. And I haven't mutated my PC to the point where I have to worry about what IBM would say if the computer lost its cool and had to go back for servicing. ■

PC News welcomes Winn L. Rosch's Down Time as a regular column.

Disks Go Generic

In an industry whose highest ideal is "PC compatibility," it's surprising that so few computer manufacturers have embraced the generic products movement. But one exceptional company dared to come out with a line containing a unique product: the Generic Diskette.

The disk's color scheme—a yellow sleeve surrounding bands of dark magnetic media—mimics that seen in rows of generic corn flakes boxes and generic bleach bottles.

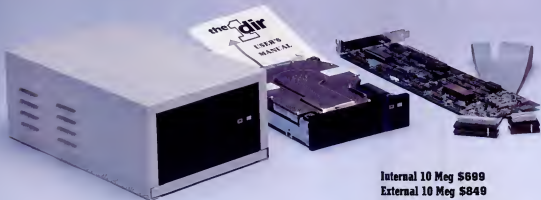
These Generic Diskettes are rather ironic: their generic colors make them look flashier than 97 percent of the world's typical, drab diskettes.

At least this diskette's manufacturer has a suitably generic name, Computer Communication Systems Incorporated, which sounds like 76 percent of all digital enterprises. You can order Generic Diskettes—or something that's probably just as good—from them at 5487 Safe Harbor Court, Fairfax, VA 22032, (703) 323-7651.

What's next? Generic Data?

—James Langdell

The Hard Disk With The Software Shell



Internal 10 Meg \$699
External 10 Meg \$849

Why pay more for 10 or 20 Meg drives than you have to? Our 10 Meg internal hard disk subsystem is priced at \$699, with the 20 Meg model going for \$1088. Our external 10 Meg goes for \$849, 20 Meg for \$1238.

Our drives are fully compatible with any IBM PC or PC-compatible with 64K RAM and PC-DOS 2.0 or later. * Qubie' drives boot directly from the hard disk. You can power up the PC and load the system directly, without using any floppy disks. No software patches or drivers to install.

Using the same amount of power as a floppy drive, the Qubie' hard disk uses less energy than other aftermarket drives.



The drives come complete with 1dir software. 1dir's commands are in English, eliminating the need to

type in DOS commands, and are all selected by using cursor control keys. 1dir even explains commands with HELP screens that give you on-line advice when you need it.

Qubie' drives are made of special plated recording media. They withstand the vibration and movement that has damaged hard disks in the past. In fact, Qubie' drives have been selected by several computer makers for use in their portable computers.

Good service starts with answering your questions before and after you buy. It continues with same or next day shipment of your order. Since we only sell a few selected products, we have the information and inventory to help you fast.

We perform repairs in our own service department within 48 hours, should you ever need service during the one year warranty period.

Our price is the whole price. All prices include UPS surface charges and insurance. In a hurry? Two day UPS air service is just \$12.

Corporations, dealers and institutions, call for volume purchase price information.

*Call for information.

No Risk Guarantee

If you are not completely satisfied with your purchase, you may return it within 30 days for a full refund, including the cost to send it back. If you can get any of our competitors to give you the same guarantee, buy both and return the one you don't like.

Order Today, Shipped Tomorrow!

For fastest delivery, send cashiers check, money order, or order by credit card. Personal checks, allow 18 days to clear. California residents, add 6% sales tax. Hours: Mon-Fri 9:00 a.m.-6:00 p.m. PST Sat. 9:00 a.m.-1:00 p.m. PST

(800) 821-4479

Toll Free Outside California

(805) 987-9741

Inside California

QUBIE'

4809 Calle Alto
 Camarillo, CA 93010

London (01) 223-4569

Paris (01) 321-5316

Sydney (02) 879-3322

© Qubie' 1984

CIRCLE 383 ON READER SERVICE CARD

OPINION

The Magazine with a Bad Attitude

Processed World asks, "Who's processing whom?"

BY FREDRIC PAUL

When you sit down at your PC, do you ever wonder whether you're doing the processing or being processed? The high-tech office environment often incorporates a bit of both. While *PC Magazine* covers the positive side of the PC user's love/hate relationship with the computer, the negative side of computing has been largely ignored. *Processed World*, "the magazine with the bad attitude," fills that gap by exposing what its founders call "the underside of the information age."

According to "Lucius Cabins" (pseudonym of a *PW* founder), "Most magazines just pass along the press releases and the hype, but *PW* tries to address the social effects of technology." It does so with an eclectic mix of bizarre humor, rebellious fiction, investigative reporting, and left-wing ideology. *PW* also encourages letters from its readers and devotes a large portion of each issue to reader opinions in an attempt to blur the distinctions between editor and audience.

Not surprisingly, *PW*'s audience is as varied as its contents. According to Cabins, "Our audience breaks down into such subgroups as clerical workers, high-tech workers (might you be one?), radical artists, and left-wing politicians."

Imaginative Mix

Although *PW* is many things to more than a few people, its left-wing orientation is apparent even in a quick glance through article titles and themes. The magazine takes a light approach with cartoons and fake ads ("Lose weight fast while eating all the ideology you can swallow" at "Marxist Computer Slimdown Kamp"); includes workers' poetry ("Bookkeeper's Lament" and "How to Survive in Business Without Really Crying"); and tackles serious issues with true-life tales of office oppression, ruminations on technology worker control and safety ("The Truth about VDTs," "The Rise of the 6-Month Worker"), and coverage of white-collar worker organi-

zation and strikes. *PW* also review pertinent events (the US Festival), books (*Why Work?*), plays, and films (9 to 5); features such satirical fiction and horror as "Through the Tinted Glass," an accidental visit to the lost souls in a personal computer's memory bank; and covers women's issues in pieces such as "For Women, the Chips Are Down." The editors even throw in advice on how to strike back at the establishment in articles such as "Sabotage: The Ultimate Video Game."

The magazine's four creators began working on *Processed World* in March 1981, while employed in low-level technical jobs for Bay Area banks. The first issue was produced in the back room of a small Haight-Ashbury apartment a month later. Issue 13 is in production now. The original staff has expanded 15 to 16 active but unpaid participants.

According to Cabins, the magazine has been breaking even since its fourth issue. "We don't have to put in money out

of our own pockets to pay for materials, but we contribute vast amounts of free labor," he says. "*PW* has 600 subscribers and prints 4,000 copies of each issue. Generally, 3,500 are gone by the time the next issue comes out."

The sliding scale of subscription prices range from \$5 for low-income individuals to \$150 for corporations and government agencies. You can buy single copies for \$1.50 if you can find them, but Cabins admits that distribution has been a problem and advises interested parties to "badger your local magazine racks" or write to *PW* at 55 Sutter St. #29, San Francisco, CA 94104.

What's Next

Besides inadequate distribution, other troubles plague the magazine. "Right now," says Cabins, "we're having problems with harassment from a local lunatic, and we've been forced out of our offices. We're trying to reorganize and go on doing what we do." That includes "outdoor activities to bring our message to people in public places where this sort of thing isn't usually found," such as Christmas caroling at malls as the "Angels of Commerce." Perhaps the most telling of *PW*'s "street theater" exploits, however, starred a staffer dressed as a giant IBM—an Intensely Boring Machine. ■

CALENDAR OF EVENTS

DATE	EVENT	COMMENT	LOCATION	CONTACT
March 31–April 3	Softcon	International conference and trade fair for software merchandisers, publishers, and corporate and institutional users.	Georgia World Congress Atlanta, GA	Northeast Expositions 822 Boylston St. Chestnut Hill, MA 02167 (617) 739-2000
April 23–25	Federal DP Expo	Computer, data communications, and office automation systems.	Washington Convention Center Washington, DC	The Interface Group 300 First Ave. Needham, MA 02194 (617) 449-6600
April 24–26	UNIX Systems Expo	Conference for users, resellers, and producers of UNIX-based hardware and software.	Moscone Center San Francisco, CA	Computer Faire, Inc. 181 Wells Ave. Newton, MA 02159 (617) 965-8350 (415) 364-4294 (CA office)

Nostradamus Utilities

HARDRUNNER™ \$34.95

Run Lotus™ 1-2-3™ and Symphony™ without the system diskette in drive A.

HardRunner is the authentic self-installing utility program that allows you to run Lotus 1-2-3 (version 1A) and Symphony (version 1.0) right off your hard-disk without the Lotus or Symphony system diskette in the A drive.

We guarantee that HardRunner makes absolutely no alterations to your Lotus or Symphony programs. In addition, HardRunner actually copy protects Lotus and Symphony on the Hard Disk.

Thousands of satisfied customers are using this product and are no longer worrying about losing or destroying their system program diskettes. Avoid the hassle and order the authentic HardRunner.

Corporate volume discount agreements available. You can protect your company from improper distribution of your system diskettes. Just lock them away safely.

(For the IBM PC/XT/AT, true compatibles, and TI Pro. DOS 2.0 or higher required.)

NOBLINK™ \$24.95

ErGoNoMiCs! Eye strain? With just a keystroke, you can change your obnoxious blinking cursor into a friendly solid block reverse video cursor in your choice of color. And if you wish, you can change it back and forth (blink/noblink) right in the middle of a program such as your word processor. We believe this product improves efficiency. The

NoBlink cursor is less distracting and does not cause the eye fatigue problems associated with blinking objects. Give your eyes a rest. This could be one of the best investments you'll ever make.

NoBlink is highly compatible. NoBlink works with DOS commands and most programs on either monochrome or graphics displays. Like the blinking cursor, NoBlink is disabled in graphics modes.

(For the IBM PC/XT/AT/Jr., true compatibles, and the TI Pro.)

TURBO-PLUS™ \$29.95

Turbo-Plus is a set of external procedures crafted in assembler language and designed specifically for Turbo Pascal's® interactive environment. Turbo-Plus includes:

Enhanced Input/Output Facility—A complete package of procedures for full utilization of pathnames, file handles, hidden files, device independence, variable length records etc. (DOS 2.0 and up)

Instant Text Display—With this procedure you can display complete screens of text in a flash. Instant Text Display is much faster than the standard procedures for display output. This procedure also provides for direct attribute specification. (IBM hardware required.)

Expanded Text Display—This procedure allows you to specify horizontal and vertical size for characters, as well as color and position. (IBM hardware and graphics adaptor.)

Call Toll Free (24 hours, 7 days a week)

1-800-453-5433.

In Utah call 1-800-662-2500.

Dealer and Corporate Inquires (801) 261-0769.

(Plus \$5.00 shipping and handling.
Outside USA, add \$15.00)

Check ☐ Money Order ☐

Visa/Mastercharge# _____

Expiration Date _____

PLEASE CHOOSE (\$5.00 shipping and handling)

- ☐ HardRunner \$34.95 + 5.00
☐ NoBlink 24.95 + 5.00 introductory offer
☐ Turbo-Plus 29.95 + 5.00 introductory offer

Name _____

Address _____

City _____

State _____ Zip _____

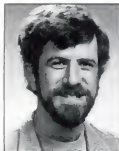
Nostradamus Inc.
5320 South 900 East
Suite 110
Salt Lake City, Utah 84117

Lotus, 1-2-3, and Symphony are trademarks of Lotus Development Corp. IBM is a registered trademark of International Business Machines Corp. Turbo Pascal is a copyright product of Borland International Corp.

Nostradamus Inc.

CIRCLE 266 ON READER SERVICE CARD

Parity Check



BY STEPHEN MANES

"If I can't get the blood off this thing and make it work, I am personally going to fly out there and run your fingers through the tractor feed!"

"Your [expletives deleted] program just wiped out 50 MB of my insurance agency's client data. If I don't get it back, YOU HAD BETTER PROVIDE FOR YOUR LOVED ONES!"

"It's war out there in the customer-service trenches," says Bill "Chief" Bender, president of Lompoc, Calif.'s SWare, Ltd. "We decided to give computer companies the firepower they need." His firm's newest product: *CusServ 9999* (it takes up that many kilobytes of hard-disk space) is billed as "using proprietary leaps in artificial-intelligence and digital/voice technology to create a complete customer-service hot-line package."

SWare's primary release thus far has been its do-all package *EveryWare*. PC's reviewer found it "as integrated as South Africa and as bug free as a Greenwich Village apartment." But Bender has managed to turn this tale into a sort of plus. "We're selling experience," he says proudly. "We've had more customer-service calls than any firm our size."

CusServ begins with an on-line tutorial that helps new users avoid mistakes in setting up their systems. You're asked to "Pick the correct area code for your service hotline: A: 800 B: 212 C: 213 D: 808."

The right answer? "D. or

Don't be a sap. An 800 number makes you pay the freight when some bozo doesn't want to bother reading the manual. 808 (Hawaii) makes everything easy as poi."

Next, the user enters a database of information about the firm's programs. "Keep it simple," advises Bender. "If you try to explain how to get everybody's printer to work with your software, you're only going to get frustrated."

The final step is creating PIP—the "personality interface profile." CusServ can answer the phone in any of ten menu-selectable human voices: everything from "janitor" to "corporate president." An added dose of realism comes from CusServ's additional menu options: knowledgeability, cooperation, and even blood-alcohol level of the "responder" can easily be tailored to your company's needs.

The "temporary clerk" option, for example, begins with such realistic responses as "I'm sorry, but our technical engineers are away from their desks at the moment," and quickly graduates to "Hey, I'm just a temp. I have no idea who the supervisor is." True to life, the "temp" has no way of accessing the database. "Keeps calls short," boasts Bender.

When combined with "junior programmer," the "arrogant" mode produces many of the classic hot-line responses users have come to expect. Answers such as, "We don't consider that a bug," "Yes, it does do that under certain conditions," "We never claimed to support non-IBM peripherals," "Gee, that's a new one," and "That will be corrected in the next update," can be tweaked to the precise edge desired.

Delay mode puts incoming callers on hold for a user-selectable period from 1 to 32,677 seconds, features a disconnect randomizer, and comes complete with seven tunes, ranging from Lawrence Welk's perky

rendition of "Karma Chameleon" to a Merv Griffin medley of Barry Manilow hits.

In addition to its own in-house research, SWare "looked at the kinds of things the major firms were doing." The result: users unwilling to customize their answering procedures can choose from ten "corporate emulation" modes.

To demonstrate, Bender selected "IBM." When a caller asked for customer service, a realistic young female voice responded, "We're sorry but we do not provide direct customer support. Please consult your dealer for assistance," and handled the increasingly irate reaction with an increasingly precise explanation of the company's policy.

SWare claims CusServ is "99.44 percent bulletproof." The program recognizes "every known English vulgarity" and provides a convincing retort at a user-selectable level of hostility.

The version of CusServ I previewed caused my monochrome monitor to emit a high-pitched whine, start to smoke, and burst into flames when I tried to use

the Screen Saver feature. A phone call to SWare's 800 number got me the response "Our 800 sales line is for orders only," and referred me to the 808 number. There, I was entertained by 10 minutes of Don Ho's version of "Thriller."

The voice I eventually spoke with (reminiscent of Clint Eastwood's) frustrated my attempts to get through to Bender by insisting, with increasing menace, that I must have installed the program incorrectly. To his credit, Bender did return my call later that day, apologized for the mixup, and told me that a monochrome version of the program would be shipped from Honolulu via first-class mail.

"By the way, I am now authorized to let you in on our biggest secret," Bender added. "Beta-test versions of this program have been in use for nearly 2 years at some of the country's top software and hardware houses. Not one caller has suspected a thing."

PC News welcomes Stephen Manes's Parity Check as a regular column.

Dialing for Juniors

After its slow start, the PCjr is catching up in a lot of ways. Now there's even an electronic bulletin board aimed at PCjr users that's run on a PCjr with its internal modem.

Although there are plenty of other breeds of bulletin board around, system operator Bill Oakes discovered it was a bit trickier to set up this one. A PCjr can't run existing bulletin-board operating programs such as RBBS because they're designed for such modems as the Hayes Smartmodem rather than for the PCjr's internal modem. Oakes had to write his own BBS operating software to run on his 640K RAM PCjr. He uses 360K of that as a RAMdisk that contains all the bulletin board's files except the user log and the BBS program itself.

This PCjr BBS serves as a forum for PCjr users' technical questions and answers; one discussion dealt with the problem of adding a second drive to a PCjr system. There are also reviews of PCjr software, ads, trivia games, and other entertaining features in the boards nine sections. About 500K of software is available for downloading.

You can reach Oakes's PCjr BBS in Los Angeles by calling (213) 659-7187. You don't even need a PCjr to call, but if you want to talk to one, it's probably the only game in town.

—James Langdell

READ ONLY

A review of the IBM Personal Computer Family. Vol. 2, No. 1



GRAPHICALLY SPEAKING

E Pluribus Unum. IBM Personal Computer graphics hardware covers a lot of territory, from graphics cards and monitors to printers and plotters. Color monitors alone are available in four models that can satisfy varying levels of color graphics requirements, from home or office to the laboratory.

Two of the most recent, for example—the IBM PC Enhanced Color Display and the IBM PC Professional Graphics Display—offer advanced business and technical graphics capabilities. The IBM PC Enhanced Graphics Adapter can also be used to

extend some of those capabilities to the IBM PC Monochrome Display and the IBM PC Color Display.

This growing array of hardware products is unified by a strong IBM Personal Computer graphics software development strategy, one that can dramatically improve your programming efficiency and broaden the application potential of your graphics programs.

Independence. Graphics software has traditionally been written for a specific graphics device and couldn't be run on a second device without complex and time-consuming reprogramming. By using the IBM Personal Computer Graphics Development Toolkit, however, you can now develop software that is compatible with all existing IBM PC graphics hardware products.

This is possible because the Toolkit contains a constant interface—the Virtual Device Interface—to which all applications can be written. The result is device-independent software.

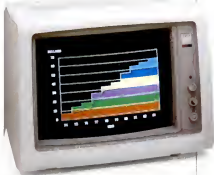
The Graphics Development Toolkit allows you to program bit-map

graphics to a 32K x 32K addressable point window and to combine graphics and text capability on a variety of graphics devices. The device drivers necessary for information exchange with existing IBM PC graphics devices are included in the Toolkit, as are a driver for the IBM PCjr Video Subsystem and language interfaces for the IBM BASIC, FORTRAN, C, and Pascal compilers and for the IBM Macro Assembler.

The right tools. Several products from the IBM PC Engineering/Scientific Series also play an important part in the IBM PC graphics programming strategy. All of them incorporate the Virtual Device Interface discussed above.

The IBM Personal Computer Graphical Kernel System—which is consistent with Draft ISO and ANSI GKS Standards—gives you a common high-level graphics language that can help further simplify your programming tasks. It also helps increase the portability of applications between computer systems.

In addition, the IBM Personal Computer Plotting System provides a



*IBM Personal Computer
Enhanced Color Display*



*IBM Personal Computer
Graphics Development Toolkit*



*IBM Personal Computer
Professional Graphics Display*

subroutine library of functions that help make it easy to produce a wide variety of charts and graphs. There's also a Metafile Interpreter available to facilitate retrieving and manipulating graphics images.

This range of IBM graphics programming tools is designed to help speed and simplify nearly every aspect of your graphics programming work. They can substantially reduce the time and tedium involved in program development, and the device independence they provide can help increase the flexibility of your finished programs. Device independence also helps extend the life—and marketability—of your programs, because applications developed with the Virtual Device Interface can interface with future generations of graphics devices.



HARDWARE NEWS

Lock and key. Troubled by people who try to peer without permission at sensitive business or personal data stored in your IBM Personal Computer? You can go a long way toward locking it up with the IBM Personal Computer Keylock Option.

Fifteen minutes and a screwdriver are all you need to install the Keylock Option on your IBM Personal Computer, IBM Personal Computer Expansion Unit, IBM Personal Computer XT, IBM Personal Computer

XT/370, or IBM 3270 Personal Computer.

Once your system unit is outfitted with the Keylock Option and locked, it will be difficult for someone without the proper key to access the hardfile and all the valuable software it contains. Also, other users in a network won't easily be able to access or tamper with data stored on your system. In fact, when the Keylock Option is installed, the system unit can be powered up only with the key and can't be powered up through the CRT plug port.

And with the Keylock Option locked in place, the system unit cover can't be removed—short of forcible entry—by just anyone who might want to browse around inside your IBM PC during off hours.

Small packages. If you need more memory but don't have a full-size slot available in your system unit, the IBM Personal Computer 256KB Memory Expansion Option may be the answer. It offers 256KB of additional memory on a short card (5 inches rather than 11 inches) with a comparably diminutive price.

That makes it ideal for adding memory to the IBM *Portable* PC. This Memory Expansion Option is also a compact way to beef up your IBM Personal Computer or IBM Personal Computer XT (which has two slots for short cards).

Talkies. The combination of film and sound revolutionized the movies. Speech capability may soon spell an equally big change for computers. The IBM PCjr Speech Attachment is a step in that direction.

It's a side-attached option for the PCjr that permits speech and sound under control of software such as IBM Writing to Read.* The Speech Attachment contains 196 words and sounds in its ROM. Cartridges manufactured with prerecorded speech can be used under program control. And with the purchase of a microphone and the proper software, you can even record your own speech data on an IBM PCjr diskette.

So far, at least, the last word is ours.

**Developed by Dr. John Henry Martin.*



WHAT'S THE PROGRAM?

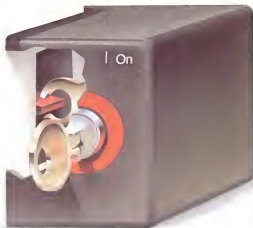
Retrieval. Whether you work with pen and paper or the latest word processing software, writing documents is only half the battle. Try finding them again a month later.

We don't claim to have discovered a better system for paper filing. But a new software package from IBM—Office Correspondence Retrieval System (OCRS)—does promise to make life a lot easier for those who store written work on a fixed disk or who have a library of documents stored on diskettes.

OCRS can help in two ways. First, it makes document abstracts and stores them in a summary file for future reference. OCRS automatically searches out keyword information such as date, subject, sender, or any other significant word. You can also add keywords other than those actually contained in the document.

Second, and most important, simple English language queries will prompt OCRS to locate the original document. A document search request can be entered as individual words or complete sentences. You don't need to learn a special query language.

OCRS can abstract and retrieve any type of file containing ASCII text such as letters, charts, and computer programs. It can also directly abstract documents written with IBM



Help protect your software and hardware with the IBM Personal Computer Keylock Option



IBM PCjr Speech Attachment

Writing Assistant, IBM PCWriter, and WordStar® and documents using the IBM Revisable Form Text Document Content Architecture (RFTDCA). Documents can be converted to RFTDCA data format by IBM DisplayWrite 1 and 2 and PCWriter.

With OCRS, missing reports may be a thing of the past. Evolution. Like their human language counterparts, computer languages and operating systems change and evolve. Occasionally, an entirely new dialect crops up, such as the IBM Personal Computer XENIX® Operating System.

IBM Personal Computer XENIX is derived from the UNIX® Time Sharing System. Several enhancements designed specifically for the IBM Personal Computer AT allow you to take full advantage of its power. IBM Personal Computer XENIX supports both single-user and multi-user configurations. It also enables you to run several programs at the same time—you can, for example, compile a program in the background while you edit one in the foreground.

There are two additional packages available to be used with the IBM Personal Computer XENIX operating system that deserve special mention. First, the IBM Personal Computer XENIX Software Development System gives you tools to generate code suitable for either XENIX or IBM Disk Operating System (DOS) operat-

ing environments. Second, there's an IBM Personal Computer XENIX Text Formatting System that can help simplify the production of technical reports, memoranda, formal papers, and documentation—it's especially useful for publications that require technical or scientific formats.

IBM DOS has been updated twice recently. DOS 3.0 provides all the functions contained in DOS 2.1 plus enhancements to support the IBM Personal Computer AT. DOS 3.1 incorporates further enhancements that support the IBM Personal Computer Network.

There are also new versions of the IBM BASIC Interpreter and of the IBM Macro Assembler. BASIC 3.0 contains several noteworthy new functions that provide access to user-installed device drivers. They are: SHELL, IOCTL, and IOCTL\$, ERDEV and ERDEV\$, and ENVIRON and ENVIRON\$.

The recent 2.0 version of the IBM Macro Assembler supports both the 8088 and 80286 processors and the 8087 and 80287 Math Co-processors. Other additions include a new more powerful Linker; a Library



Office Correspondence Retrieval System Software from IBM

Manager, and a Structured Assembler Language Preprocessor. And you can use the IBM Professional Debug Facility to put the finishing touches on your assembler language programs.

See your authorized IBM Personal Computer dealer or IBM Product Center about an economical trade-up from your 3.0 version of IBM DOS to version 3.1 or from Macro Assembler version 1.0 to 2.0.

WordStar is a registered trademark of MicroPro. XENIX is a registered trademark of Microsoft Corporation. UNIX is a registered trademark of AT&T's Bell Laboratories.



BUDDING USER GROUPS

Getting started. Ever considered forming a group to exchange ideas about using your IBM Personal Computer, but never got around to sorting out all the start-up details? Or, once past that first stage, does your group find it difficult to come up with new information, presentation materials, and connections with other groups?

Help is at hand.

Because of the growing interest in PC user groups all across the country, IBM has expanded its efforts to encourage new groups and to support existing ones. There's no charge for this assistance, and all groups—whether they have 10 or 1,000 members—are eligible for the same basic level of support.

For starters, the IBM User Group Support department will provide a package that introduces you to some of the basics of organizing a club. It includes a sample constitution and bylaws, suggestions for officers' titles and duties, and a list of other groups already in the program.

Staying started. Once the initial burst of enthusiasm is past, a PC user group needs more than a common interest to maintain its membership—it needs some focus for that interest. IBM can provide information and materials to help keep your group going.

Perhaps the most impressive

form of support is a monthly newsletter on diskette, complete with color and sound. It includes reviews of new products, editorial commentary, and technical tips. The newsletter also carries reprints of the best articles from participating group newsletters, so you can follow the activities of other user groups around the country.

Other sources of useful information are the PC User Group Phone Line and PC User Group Bulletin Board System. You can use the phone line to get answers to questions about the organization and functions of a user group and to find out about other groups in your area.

The bulletin board, which can be accessed through your IBM Personal Computer, carries new production information from the day of announcement. It also provides a means of communicating with other PC clubs.

Finally, to provide topics of interest for your regularly scheduled meetings, IBM will send timely presentation and demonstration materials. Better still, group officers can use the phone line to request guest speakers from IBM for special meetings.*

For more information about participating in the IBM User Group Support program, please write to: IBM User Group Support, IBM Corporation 2900, P.O. Box 3022, Boca Raton, FL 33432.

*The availability and frequency of guest speakers depend on the size of the group, its location, and meeting night.



HARDCOPY

Hidden talent. Think of the many entertaining and useful programming ideas that must exist out there but never find their way to market.

The IBM *Directory of Personally Developed Software* gives you direct access to some of that hidden talent. It's a catalog of new programs developed by individuals for the IBM Personal Computer Family.

The best news is the prices. Programs listed in the *Directory* sell for as little as \$14.95. They cover a wide range of interests, from entertainment and education to personal productivity and business applications.



The Directory of Personally Developed Software from IBM

Each program in the *Directory* has a full description that includes system requirements and illustrations or color photos of representative screens. Programs may be ordered by mail or through an 800 telephone number.

To subscribe to the *Directory* call 800-IBM-PCSW.

IBM



TIPS AND TECHNIQUES

Added color. Bored with the black screen that appears on your IBM PC Color Display when you boot up your system? There are lots of other color possibilities, and the brief program below shows you how to set them from DOS.

It will give you a display with a black border around a rectangle 80 columns wide and 25 lines high. The program can be used in an AUTO-EXEC. BAT file to produce a starting color, and DEBUG will maintain the color you set.

All you have to do is substitute number or letter values for the colors you want where the ?? appear in the following program. For the first ?, substitute one digit (0-7) for the background color. For the second ?, substitute either a digit or a letter for the foreground color (1-7 for regular colors, 9-F for intensified colors). For example, 2B will give you grey text on a green background. For a complete listing of the color codes, see the Color Statement section of your IBM BASIC manual.

To set your screen colors, do the following from the DOS prompt:

```
A>debug color.com
File not found (ignore this message)
-rxx
:20
-e 100 2b c0 le 50 b8 03 00 cd 10 ba
(0) 06 b9 00 (0) ba
-e 110 50 20 b7 ?? cd 10 b4 02 ba 00
(0) b7 00 cd 10 cb
-w
writing 20 bytes
-q
```

Thereafter, you need only type "color" at the initial DOS prompt after booting your system to change the display from black and white to your preset colors.

For more information about IBM Personal Computer products discussed in this issue of *Read Only*, see your authorized IBM Personal Computer dealer or IBM Product Center. To learn where, call 800-447-4700. In Alaska and Hawaii, 800-447-4890.

© 1984 International Business Machines Corporation
Little Tramp character licensed by Rubble Inc., a.s.

THE SIMPLE APPROACH IS THE SYMBOL APPROACH.

```
10 S=0
20 FOR I=1 TO 100
30 INPUT X
40 IF X = 0 GOTO 70
50 S=S+X
60 NEXT I
70 PRINT S/(I-1)
```

BASIC

A program to calculate averages...

```
REAL X(100)
READ*,N,(X(I),I=1,N)
S=0
DO 10 I=1,N
10 S=S+X(I)
PRINT *,S/N
END
```

FORTRAN

just shrunk from seven lines...

$(+ / \times) \rightarrow \rho X \leftarrow \square$

POCKET APL

to one.

INTRODUCING POCKET APL™

Pocket APL, a new PLUS*WARE™ product, symbolizes a whole new way to solve problems. Faster than Fortran. Simpler than Basic. And at a cost much less than Cobol and many other programming languages. Its use of symbols makes it concise and efficient—powerful and productive.

WORKING IN SHORTHAND= WORKING FASTER, SMARTER.

Pocket APL allows you to shrink the length of your programs. Because just a few symbols say what takes lines and lines to say in other programming languages. So Pocket APL cuts the drudgery and need for tedious sub-routines and long lists of commands.

GET FLEXIBILITY > WITH CANNED SOFTWARE.

Pocket APL is a complete APL implementation with enhancements like online HELP, windowing, report formatting, dual file system, and debugging aids. It's also a powerful online calculator. So you don't have

to switch back and forth between programs or from your hand-held calculator to the computer.

And the symbols? Simple. You'll learn them fast. They'll become as second nature to you as +, -, ×, and ÷. Once you start using them, you'll be programming four to 10 times faster than with conventional languages. And as your needs grow, you can easily upgrade to STSC's APL*PLUS®/PC

System for even more features—like communications and graphics.

POCKET APL COSTS MUCH < YOU'D EXPECT.

Pocket APL makes programming easy. And priced at just \$95, it's easy on the budget, too. It works with IBM PC's and compatibles and requires only 128K. So if problem-solving is taking up too much of your time, the answer is symbol. Pocket APL.

To order, or for more information, call 800-592-0050. In Maryland, call (301) 984-5123.

Or write STSC, Inc., 2115 East Jefferson St., Rockville, MD 20852. All major credit cards accepted.



Problem-solving at the speed of thought.

STSC
A Carter Company

Pocket APL uses a soft character set for computers with IBM-compatible graphics board or color monitor; keywords for computers with monochrome. Optional character generating ROM can be ordered for IBM PC monochromes or Hercules monochrome boards.

PLUS*WARE and Pocket APL are trademarks of STSC, Inc. APL*PLUS is a service mark and trademark of STSC, Inc., registered in the U.S. Patent and Trademark Office and in other countries.

Micros. Mice.

ORDERS ONLY

1-800-241-8149

At Micro Mart, we've got our finger on the pulse of the microcomputer industry. And, we're in touch with the very latest developments, the newest products and the cutting edge of expert advice.

When you need the right product at the right price, remember the sales, service and support our national distribution center can give you.

So let us point you in the right direction. Ask for your best price and expert advice.

AT&T Personal Computer. Innovative hardware for a wide range of business applications.



128K expandable to 640K, 2-360K, DS/DD Disk Drives, Monochrome Display, IBM Compatible. Special introductory price.

LEADING EDGE Color PC, 256K, 2-360K DS/DD Disk Drives, Amdek Color 600. \$1995
MINDSET Personal Computer, 256K, 2-360K DS/DD Disk Drives, W/Mindset Mouse. \$1795

Networking/Protocol Conversion

SNA & BISYNC 3780, 5251, 3274, 3278
PC TURBO 186 by ORCHID, 80186 coprocessor board. \$829
IRMA/IRMA LINE Replaces 3278's w/PC's. \$899/\$1099

FORTEGRAPH for IRMA, upgrades IRMA to 3278 graphics capability.
IRMA PRINT Enhances IRMA graphics.
PCnet By ORCHID, complete line. Start @ \$299
BLUE LYNX 5251 Mod 12 & 3276 Emulators by TELAND.
SANTA CLARA PC Terminal.

Printers & Plotters

Thousands in stock.
HOUSTON INSTRUMENTS Plotters and Digitizers.

Dot Matrix
EPSON FX80/100. _____
EPSON RX80/100. _____
EPSON LQ1500. _____
EPSON JX80, color printer. _____
OKIDATA 92 & 93, ML84, (200 cps.), w/opt. IBM PROMS, Pacemark 2410, (350 cps). \$1295/\$799

TOSHIBA P-1351 & 1340. _____
DATA PRODUCTS
P-Series 8050 Color, & 8070, 132 col., 200 cps.

STAR MICRONICS
Complete line.
TEXAS INSTRUMENTS 855. \$729
NEC Pinwriters, P2 & P3, 180 cps.

DIABLO C-Series C-150, Color ink jet, IBM color compatible. _____
Letter Quality
NEC Spinwriters 2050, 3550, 8850.

DIABLO 630/630ECS. CALL
C-ITOH Starwriter, (40 cps), Printmaster, (55 cps). \$950/\$1299
We carry a full range of form handling options.

Floppy Disk Drives

TANDON TM 100-2, DD/DS, 360K. \$185
1/2 HEIGHT DISK DRIVES FROM SHUGART, TEAC, PC, XT & AT compatible. \$119

Hard Discs

Micro Mart carries all the major brands. If you don't see it—ask for it.
PEACHTREE PERIPHERALS
P-10, 20 & 50, auto boot, int. & ext. Start @ \$795

SYSGEN 10 & 20 Meg w/streamer tape. \$2195/\$2795
SYSGEN Image & Quickfile, streamer tape back-up for your IBM XT & AT.

BERNOULLI
TECHNOLOGY Hard Disc Subsystems. \$2895
MAYNARD Complete line of hard disc subsystems.

EMERALD Hard disc drives w/back-up.

Chips

INTEL 8087 High speed coproc. \$169
64K RAMCHIPS. \$35/\$64K
256K RAMCHIPS.

Multifunction Boards

We have a complete line of multifunction boards compatible with the Portable, AT, XT, & Jr.

SIX PAK 64-384K, multifunc. _____
MEGAPLUS 64-512K, max. 8 func. _____
U/O PLUS Ser., Clk., Splr., Ramdisk, opt. 2nd Ser., Par. & Game _____
QUADRAM QUADBOARD, 64-384K, multifunc. \$259
TECMAR CAPTAIN, 0-384K, multifunc. \$199
TALLTREE J-RAM II, 0-512K, w/software. _____
TALLTREE J-RAM IIX, 0-512K, w/software. \$129
MICROLOG BABY BLUE II, 64-256K, 280 coproc., + software. _____
ORCHID PC Blossom, 64-384K, w/opt. PCnet Piggy-Back. \$259

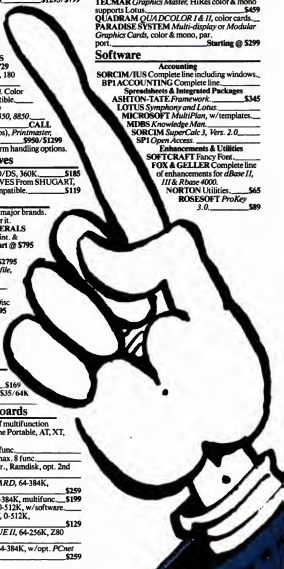
MAYNARD Complete line. _____

Graphic Cards

STB Graphics Plus II, color & mono, w/par. port & software. \$369
HERCULES Mono & color graphics cards support Lotus.
PLANTRONICS ColorPlus+, HiRes color bd., par. port w/software. _____
TECMAR Graphics Master, HiRes color & mono supports Lotus. \$459
QUADRAM QUADCOLOR I & II, color cards. _____
PARADISE SYSTEM Multi-display or Modular Graphics Cards, color & mono, par. port. Starting @ \$299

Software

Accounting
SORCIM/TUS Complete line including windows. _____
BPI ACCOUNTING Complete line. _____
Spreadsheets & Integrated Packages
ASHTON-TATE Framework. \$345
LOTUS Symphony and Lotus. _____
MICROSOFT MultiPlan, w/templates. _____
MDBS Knowledge Man. _____
SORCIM SuperCalc 3, Vers. 2.0. _____
SP1 Open Access. _____
Enhancements & Utilities
SOFTCRAFT Fancy Font. _____
FOX & GELLER Complete line of enhancements for dBase II, III & Rbase 4000. _____
NORTON Utilities. \$65
ROSEOFIT ProKey 3.0. \$89



Advice. Price.

CENTRAL POINT SOFTWARE

Copy II PC. \$35
ATI Training. \$55
SOFTSTYLE Set FX + and Printworks. Printer control packages. \$45
SIDEWAYS Inverts printout. \$45
BORLAND Sidekick. \$39
LIVING VIDEO TEXT Think Tank.

Compilers & Language Tools \$299
LATTICE C-Compilers. \$299
MICROSOFT C-Complete line.

WORDTECH The dBase compiler. \$299
DIGITAL RESEARCH Complete line.
BORLAND Turbo Pascal, Turbo Toolbox and more. \$39/each

Graphics & CAD
Zaef PC Paint Brush, mouse driven graphics. \$95

DECISION RESOURCES
ChartMaster/Sign-Master pkgs.

AUTODESK AutoCAD. Complete line.
ENERTRONICS Energraphics, graphics & CAD package.

MICROPRO ChartStar.

Microsoft Mouse. Bus or serial mechanical mouse, comes with Mouse Menu software. Works with WORD and other popular software. \$159



PC Mouse, from Mouse Systems. Serial optical 3-button mouse with Pop-Up™ Menus and PC Paint software. Preconfigured for all the most popular software. \$159

MICROSOFT Chart.
DIGITAL RESEARCH Presentation Master.

Communications
MICROSTUF CROSSTALK XVI. \$99

HAYES SMARTCOM II.
Word Processors

MULTIMATE w/Spelling checker & tutorial \$299
SAMNA III, w/d. processor.

MICROSOFT Word, w/or w/out mouse.
LIFETREE Volkswriter Deluxe.

SSI WordPerfect.
WORDMARC Wordmarc.

Office & Project Planning
Call for our Tax and Tax Planning packages.

HARVARD Harvard Project Manager. \$249
IUS Easy SalesPro.

MICROSOFT Project.
Data Base Managers

MICRORIM 4000 or 6000, Report Writer & Clout options.

GMS SYSTEMS Power-base.
WARNER SOFTWARE The desk organizer.

ASHTON-TATE dBase II & III.
MICROSTUF Infoscope.

Modems
HAYES Smartmodem 300, 1200, & 1200B.

RIXON 1200-4800 BAUD sync. & async. models.
ANCHOR AUTOMATION Signalman Mark XII.

VEN-TEL 1200 BAUD Half Card for the IBM Portable & XT. \$259

POPCOM Popcom, int. and ext. w/voice & data comm.

Miscellaneous
Hardware

& Accessories
DYSAN Diskettes, PC, XT & AT compatible.

MICRO MART Diskettes
DS/DD, 7 yr. war. \$19/10

KEYTRONICS 5150 & 5151.
Keyboards.

LO SHEET FEEDERS Sheet feeders.
CURTIS Accessories.

HAYES Mach II & Mach III joysticks.
PERCEPT Penpad, software avail. \$775

TOUCHSTONE TECHNOLOGY
Touchstone I. Ten key pad w/ cursor control.

QUADRAM MICROFAZER, print buffer, 8-128K.

TRIPPELITE Back up power supply
200-1000 watts, and ISOBAR surge protectors, 4 & 8 pin.

Monitors & CRT's
PGS MAX 12, amber, 720h x 350v.

PGS SR-12, 690h x 480v, w/ dual scan cd.
PGS HX-12, 690 Dot RGB.

QUADRAM QUADCHROME, 690 Dot RGB. \$439

AMDEK COLOR 300, 500, 600, 700, 710, 725,
new complete line of HiRes RGB's w/ new low prices.

AMDEK 300A/300G, composite monitors. \$139/\$129

AMDEK 310A, amber w/3 yr. war. line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

WYSE Terminals, 100, 75, 50, entire line in stock.

Service & Repairs

*On-Site—We have hundreds of service locations nationally.

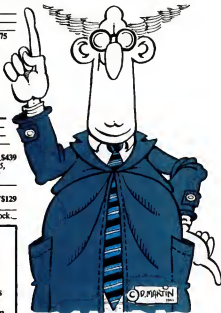
*Depot—Our National Service Center is one of the fastest in the US.

*We have—A wide variety of services available. Just call us.

© Copyright Micro Mart 1984.
Technology Corporate Campus
3159 Campus Drive
Norcross, Georgia 30071

For information, call

(404) 449-8089



Micro Mart has financing options available. Ask for a Micro Mart Blue Chip Credit Card application today.

*Prices are subject to change without notice and may not be applicable in retail outlets.

America's PC Specialist.

MICRO MART™

IBM is a registered trademark of International Business Machines Corporation. AT&T, Leading Edge, Minstar, Microsoft, Mouse Systems and their products, respectively, are trademarks of AT&T Information Systems, Leading Edge Products Inc., Minstar Corporation, Microsoft Corporation and Mouse Systems Corporation. All Prices are subject to change without notice.

CIRCLE 478 ON READER SERVICE CARD

COLOR 400

SIGMA DESIGNS' new Color 400™ makes your PC an electronic canvas. Color 400 . . . a revolutionary board for the IBM PC*, XT* and AT*. With a 640x400 resolution in non-interlaced mode, it automatically **DOUBLES the number of displayed lines on standard, 200 line software. Gives you 16 vibrant colors in WordStar*, Keeps numbers and characters razor sharp in Lotus 1-2-3*, SuperCalc*, and others. And provides all points addressable graphics capability!**

Voilà

All you have to do is plug it in. There's no software to change. No switches to switch. No cables to confuse.

Just turn on your PC. Then tune into a whole new colorful world of illustration: figures, charts, graphs and symbols.

Be an artist. With PC Paint† and a PC Mouse†, you can: Paint. Draw. Shade. Print.

Type. Underline. Change Fonts. Bold Face.

Cut. Paste. Publish. Dress up slides with presentation quality color. In a snap you can: Categorize. Subtotal. Total. Footnote. Qualify. Cross

Tab. Extend . . . and more, in a variety of highlighted colors to make spreadsheets and charts take on a new, explosive meaning.

And for maximum performance, use the Color 400 with a high resolution monitor like SIGMA DESIGNS' new CM-12™ or the Princeton Graphics' SR-12*. So, ask to see a live demonstration of the Color 400 at your nearest dealer.

If you don't find us at your local store, call or write for the one nearest you.

CIRCLE 187 ON READER SERVICE CARD



SIGMA DESIGNS

SIGMA DESIGNS, INC.
2023 O'Toole Avenue
San Jose, CA 95131
(408) 943-8480
Telex: 171240

†PC Paint and PC Mouse are trademarks of Mouse Systems. Both are available with the Color 400 at an extra cost of \$100 when purchased all together (a \$200 savings).

*IBM PC, XT, AT are trademarks of IBM Corp. WordStar, Lotus 1-2-3, SuperCalc and Princeton Graphics SR-12 are respective trademarks of Micro-Rev, Lotus, Sorcim and Princeton Graphics.

Tektronix 40XX Terminal Emulation

EMU-TEK™ IS NOW AVAILABLE FOR IBM PC, XT, AND MOST COMPATIBLES

- Access powerful mainframe graphics using:
 - PLOT 10 (trademark of TEKTRONIX, Inc.)
 - DISSPLA (registered trademark of ISSCO)
 - SAS/GRAPH (trademark of SAS INSTITUTE, Inc.)
 - DARC (available from QUESTEL, Inc.)
 - and most similar packages and services.
- Upgrade from dim storage tubes to bright raster scan technology, with complete software compatibility.
- Increase versatility with options such as:
 - High resolution board support (HERCULES, etc.)
 - Local pen-plotter support (HP, AMDEK, etc.)
 - Hard copy on EPSON or IBM matrix printer
 - LIGHT PEN for graphic input
 - Advanced communications program features
 - Other terminal emulations, including:
 - VT100 (trademark Digital Equipment Corp.)
 - ADM3 (trademark Lear Siegler, Inc.)
 - RETRO-GRAPHICS (trademark Digital Engineering, Inc.)
- **\$395.00 PLUS OPTIONS**
- **30 DAY NO-RISK TRIAL PRIVILEGE.**

Call or write us, or see your participating dealer.



FTG
DATA SYSTEMS

10801 Dale St./P.O. Box 615
Stanford, CA 94306
(714) 995-3900

THE LIGHT PEN FOR YOUR PC IS NOW EVEN BETTER!



- New photo-optical push-tip switch for super reliability.
- **30 DAY NO-RISK TRIAL PRIVILEGE**, and **TWO** year limited warranty.
- Ideal keyboard alternative for INTERACTIVE GRAPHICS, MENU SELECTION, EDUCATIONAL PROGRAMS, and just plain fun.
- Compatible with a growing library of software:
 - PC-DRAW (trademark of MICROGRAFX)
 - MICRO-CAD (trademark of COMPUTER AIDED DESIGN)
 - SARGON 3.0 (trademark of HAYDEN PUBLISHING)
 - and much much more. (Complete list on request).
- Very high performance and reliability for just \$195.00. (Optional three diskette software package is just \$39.00)
- Ultra-deluxe version soon available (\$295.00).
- Got another pen?? Ask about our trade-in special.



FTG
DATA SYSTEMS

10801 Dale St./P.O. Box 615
Stanford, CA 94306
(714) 995-3900

CIRCLE 250 ON READER SERVICE CARD

Can your editor work with 16,000,000 bytes of memory? SPF/PC™ 1.8 from CTC can!

The best full screen editor for the IBM PC is now even better than ever.
It looks and works like IBM's large system SPF editor, but SPF/PC
executes faster and handles larger files than its mainframe cousin.

AT EXTENDED MEMORY

SPF/PC can use up to 15,850 KB of memory.

TOP VIEW COMPATIBLE

SPF/PC supports windowing and background execution.

COMMUNICATIONS FEATURE

Easy to use communications software.

\$195

UPGRADES only \$50

(\$10 if communications upgrade)

Add \$5 for shipping
Canada \$10 Foreign \$15



Check or purchase order
accepted

FAMILY TIES

- SPF/PC is used by IBM to demonstrate the IBM 3270/PC to its corporate clients
- SPF/PC provides the same outstanding performance on any PC, from JR to AT
- SPF/PC works with DOS 1.00-3.00 and any IBM PC or true compatible with 192K

IBM is a registered trademark of International Business Machines, Inc. SPF/PC is a registered trademark of Command Technology Corporation

**TO ORDER
SPF/PC...**

Contact: Command Technology Corporation
1900 Mountain Boulevard
Oakland, CA 94611

**(415) 339-3530
Telex: 509330**

It all adds up...

MODEMS

Volkemodem	\$89.99
Mark VI...	\$189.00
Mark XII (1400 Baud)	\$209.00
Smartmodem 300	\$199.00
Smartmodem 1200S	\$399.00
Smartmodem 1200	\$449.00
Smartmodem 2400	\$899.00
SmartCom II	\$75.99
Chronograph	\$199.00
Novation	\$99.99
J-Cat	\$329.00
Smart Cat Plus	\$179.00
Smart Cat 103	\$399.00
Smart Cat 103-212	\$399.00

MONITORS

300 Green	\$129.00
300 Amber	\$149.00
310 Amber IBM Plug	\$169.00
Color 300/Amber	\$259.00
Color 500 Compelit/RGB/TCR	\$369.00
Color 500 Hi-Res (768x400)	\$439.00
Color 700 Hi-Res (768x400)	\$499.00
Color 710 Long Phosphor	\$679.00
BMC	\$85.99
1201 (12" Hi-Res Green)	\$209.00
9191U Color	\$229.00
191 Color Plus	\$229.00

NEC

JS 1201 Green	\$139.00
JS 1205 Amber	\$148.00
JO 1210 Color	\$239.00
JC 1216 RGB	\$379.00

PRINCETON GRAPHICS

Max 12 Mono	\$199.00
HX-12 RGB	\$459.00
SN-12 RGB	\$629.00

QUADRAM

5400 Quadchrome 12"	\$459.00
6410 Quadchrome 12"	\$479.00
5420 Quadchrome 12"	\$109.00

*TAXAN

116 Green Mono	\$139.00
116 Amber Mono	\$149.00
121 IBM Green TTL	\$149.00
122 IBM Amber TTL	\$159.00
210 RGB/Composite	\$249.00
420 Hi-Res RGB	\$469.00

Zen

ZVM 122 Amber	\$29.99
ZVM 123 Green	\$84.99
ZVM 124 IBM Amber	\$149.00
ZVM 131 Color	\$309.00
ZVM 133 RGB	\$429.00
ZVM 135 RGB/Composite	\$459.00
ZVM 136 RGB	\$639.00

DISK DRIVES

8 1/4" 380K TM 100-2	\$189.00
IDEA	
5 to 48MB Hard Drives	\$1299.00

PRINTERS

BMC	
EX 50 Dot Matrix	\$229.00
EX 100 Dot Matrix	\$349.00
401 Letter Quality	\$559.00
CITIZEN	
Prowriter 7500	\$259.00
Prowriter 8610P	\$339.00
Son of Starwriter A10P	\$479.00
Starwriter F10-40P	\$549.00
Printmaster F10-85P	\$1099.00
COMREX	
Comewriter II Letter Quality	\$445.00
4000	\$949.00

DIABLO

36	\$1096.00
680 Letter Quality	\$749.00
630-API Letter Quality	\$1849.00
630-ES	\$1779.00

EPSON

FX50, FX50PT, FX100, NEW	CALL
FX80, FX100	LOW
LQ 1800, JX-50 Color	PRICES

JUKI

6100	\$449.00
6300	\$749.00

MANNESMANN TALLY

Spirit 80	\$289.00
180L	\$629.00
180L	\$749.00

QUADRAM

Quadjet	\$749.00
---------	----------

NEC

8087	\$339.00
2080-IBM	\$639.00
2080-IBM	\$1399.00
8030	\$1899.00
9450-IBM	\$1749.00
Pinwriter	CALL

OKIDATA

82, 83, 84, 92, 93, 2350, 2410	CALL
--------------------------------	------

OLYMPIA

Needpoint Dot Matrix	\$359.00
Compact 2 Letter Quality	\$469.00
Compact 80	\$469.00

SILVER REED

Letter Quality 400	\$279.00
Letter Quality 500	\$349.00
Letter Quality 550	\$459.00
Letter Quality 770	\$799.00

STAR MICRONICS

5010	\$249.00
5016	\$418.00
5010	\$379.00
5016	\$499.00
5010	\$549.00
5016	\$659.00
Powertype	\$329.00

TOSHIBA

1340	\$759.00
1351	\$1349.00
1351 Tractor	\$189.00

MULTIFUNCTION CARDS

IDEA	
IDEAmax - ZPR, 64K, C & P	\$229.00
IDEAmini - YPR, C & P	\$189.00
IDEAminimax - MPA 128K	\$249.00
IDEAshare Software	\$219.00

QUADRAM

Quadboard	\$229.00
Quadboard II	\$249.00
Expanded Quadboard	\$339.00
Quad 612	\$279.00
Quad & Meg	\$279.00
Memory Board	\$269.00
Quad Jr Exp. Chassis	\$539.00
Quad Jr Exp. Memory	\$219.00
QuadMem Jr	\$229.00

AST

Six Pack Plus	\$239.00
Mega Plus II	\$269.00
I/O Plus II	\$139.00
Memory MBII	\$249.00
Advantage AT	CALL

TECMAR

Captain - 64	\$249.00
Captain Jr. 128K	\$339.00

PARADISE

Five Pack G.A.P.	\$169.00
------------------	----------

VIDEO CARDS

Amdak MAIL	\$249.00
AST - Monograph Plus	\$409.00
Graph Pak	CALL
Heroline - Graphics	\$349.00
Color	\$199.00
Paradise Modular Graphics	\$319.00
Multi-Display	\$299.00
Eagle - Color	\$219.00
Quadram - Quadcolor I	\$219.00
Quadram - Quadgraph	\$379.00

MAINFRAME

AST 8681/11	CALL
5261	\$279.00
3780	\$639.00
RBC	\$499.00
DCA IRMA 3270	\$999.00

ACCESSORIES

Quadram - Chronograph	\$69.99
Parallel Card	\$69.99
Microfiche - from	\$139.00
Eraser (Epson) 5K	\$79.99
Eraser (Epson) 64K	\$149.00
Keytronics 6180, 6161, 6161 Jr. &	
6149 Jr. Keyboards	Call

MEMORY CHIPS

4164 RAM Chips (set of 8)	\$29.99
---------------------------	---------

GRAPHICS TABLETS

Koala Pad w/Micro Painter	\$95.99
Personal Peripherals Supersketch	\$39.99



COMPUTER MAIL ORDER

TOLL FREE ORDER LINE **1-800-233-8950**

In PA Call: (717) 327-9575

WEST

P.O. Box 6069, Dept. B103
Stateville, NY 80449

EAST

477 E. 3rd St., Dept. B103
Williamsport, PA 17701

Order Status Number: (717) 327-9575 Customer Service Number: (717) 327-1450

Open purchase orders accepted with net 30 days terms, subject to credit approval. Next day shipping on all stock items. No risk, no deposit on C.O.D. orders and no waiting period for certified checks or money orders. Add 3% (minimum \$5) shipping and handling on all orders. Larger shipments may require additional charges. NY and PA residents add sales tax. All items subject to availability and price change. Call today for our catalog



CANADIAN ORDERS

Ontario/Quebec: **1-800-268-3974**
Other Provinces: **1-800-268-4558**
In Toronto: (416) 268-0866 Telex: 06-218960
2505 Dunwin Drive, Unit 3
Mississauga, Ontario, Canada L5L1T1

the best prices

IBM PC SYSTEMS PRICED FROM \$1599.99

256K, 1-DS/DD DRIVE, KEYBOARD

SOFTWARE ASHTON-TATE

Framework	\$349.00
SHRINK II	\$299.00
SHRINK II upgrade	\$139.00
SHRINK III	\$359.00
Friday!	\$179.00

ALPHA SOFTWARE

Electronic Desk	\$219.00
-----------------	----------

CDEX

Training Programs	each \$49.99
-------------------	--------------

CONTINENTAL SOFTWARE

Home Accountant Plus	\$69.99
1st Class Mail	\$79.99

ELECTRONIC ARTS

Get Organized	\$139.00
---------------	----------

FOX & GELLER

GEZ	\$299.00
Onafix	\$139.00
dUtil	\$49.99
dGraph	\$139.00
QuisKode	\$139.00

FUNK SOFTWARE

Sidekicks	\$79.99
-----------	---------

Hayes

Please	\$249.00
--------	----------

HARVARD

Harvard Project Manager	\$229.00
-------------------------	----------

EasyFiler	\$229.00
EasyPlanner	\$149.00
EasyWriter II (spell/write/mail)	\$249.00

LIFETREE SOFTWARE

Volkswriter	\$119.00
Volkswriter Deluxe	\$169.00

Lotus

1-2-3	\$399.00
Symphony	\$449.00

HUMAN EDGE SOFTWARE

Communication Edge	\$129.00
Management Edge	\$155.00
Simulation Edge	\$195.00
Axis Edge	\$155.00

WordStar 5000	\$299.00
WordStar 5000 +	\$369.00

WordStar ProPack	\$279.00
WordStar ProPack Plus	\$359.00
WordStar	\$219.00
MailMerge	\$69.99

CALL FOR YOUR FAVORITE PC/COMPATIBLE

Columbia Data, Corona
Eagle, Zenith

SANYO

MBC 580	\$699.00
MBC 580 S	\$749.00
MBC 585	\$849.00
MBC 585 S	\$1099.00
MBC 775 Portable	CALL

MECCA

Manage Your Money	\$139.00
-------------------	----------

MICROSIG

Crosstalk XVI	\$108.00
Remote	\$99.99

MICROSOFT

Multi Plan	\$139.00
Multi Tool Word w/Mouse	\$229.00

MULTIMATE INT.

Multi Mate	\$289.00
------------	----------

PEACHTREE SOFTWARE

Peachtect 5000	\$189.00
Peachpack (GLAPAR)	\$219.00

PI

File	\$69.99
Report	\$79.99
Graph	\$69.99
Write	\$69.99
Proof	\$99.99
Access	\$65.99
Plan	\$69.99

ROSESOFT

Pro Key	\$89.99
---------	---------

SOFTWARE ARTS

TK Solver	\$279.00
-----------	----------

SSI

Word Perfect	\$279.00
--------------	----------

SYNAPSE

File Manager Plus	\$69.99
-------------------	---------

VISICORP

VisiCalc 4	\$169.00
------------	----------

MICROMIM

R Base 4000	\$279.00
-------------	----------

Professional Software

PC Plus/The Boss	\$289.00
------------------	----------



Corporate Buyers Are Welcome!!!!

SPI

Open Access	\$339.00
-------------	----------

SPINNAKER

Fraction Fever	\$24.99
Story Machine	\$24.99
KinderComp	\$22.99
Facemaker	\$24.99
Key Ditch Diddle	\$22.99
Rhymes & Riddles	\$22.99
Snooper Troops 1 or 2	\$24.99
Search of Most Amazing Thing	\$24.99

INFOCOM

Witness	\$29.99
Zochaner	\$29.99
Phanetail	\$29.99
Suspended	\$29.99
Starcross	\$27.99
Zork I, 2, or 3	\$27.99
Infidel	\$29.99

CENTRAL POINT

PC Copy II	\$99.99
------------	---------

DISKETTES maxell.

MD 1	\$19.99
MD 2	\$29.99

Dennison

Elephant 5DD EM-1	\$16.99
Elephant 5DD EM-9	\$17.99
Elephant 5DD EM-8	\$24.99
Elephant 5DD EM-5	\$24.99

VERBATIM

5DD	\$21.99
5DD	\$29.99



COMPUTER MAIL ORDER

TOLL FREE
ORDER LINE **1-800-233-8950**

In PA Call: (717) 327-9575



CANADIAN ORDERS

Ontario/Quebec: **1-800-268-3874**

Other Provinces: **1-800-268-4558**

In Toronto: (416) 628-0866 Telex: 06-218960

4500 Danwin Drive, Unit 3

Mississauga, Ontario, Canada L5L1T1

WEST

P.O. Box 6659, Dept. B103

Stateville, NY 59449

EAST

477 E. 3rd St., Dept. B103

Williamport, PA 17071

Order Status Number: (717) 327-9576

Customer Service Number: (717) 327-1450

CANADIAN ORDERS: All prices are subject to shipping, tax and currency fluctuations. Call for exact pricing in Canada. INTERNATIONAL ORDERS: All orders placed with U.S. offices for delivery outside the Continental United States must be pre-paid by certified check only. Include 3% (minimum \$5) shipping and handling. EDUCATIONAL DISCOUNTS: Additional discounts are available to qualified Educational Institutions. APO & FPO: Add 3% (minimum \$5) shipping and handling. CIRCLE 185 ON READER SERVICE CARD

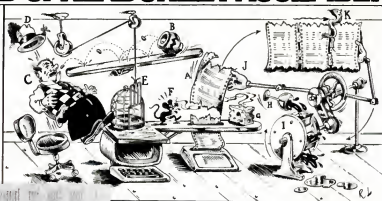
SIMPLIFIED SPREADSHEET ASSEMBLY

RISEING SPREADSHEET (A) KNOCKS MEXICAN JUMPING BEANS (B) INTO MOUTH OF NEUROTIC MAN (C) WHO IS SO DISCOMBOLATED THAT HE HURLS BEANS ON END, DISRUPTING HAT (D) WHICH OPENS CAGE (E) AND RELEASES EPICUREAN MOUSE (F).

MOUSE, INSPIRED BY SCENT OF PERFECTLY ASED CAMEMBERT CHEESE, GRABS THROUGH SPREADSHEET ONLY TO DISCOVER THAT HE'S BEEN FOOLED BY GORGONZOLA OF OVER-RIPED GORGONZOLA (G).

IN A FIT OF PIQUE HE SPILLS VINTAGE WINE (H) INTO WATER-WHEEL (I) WHICH TURNS PULLEY THAT CAUSES GLOVE (J) TO GRASP SPREADSHEET AND MOVE IT TO TAPING AREA.

SHEET IS TAPED SECURELY IN PLACE BY TRAINED ADHESIVE TAPE WORM (K).



MADE SIMPLE.

Now you can save time, aggravation, adhesive tape, and Gorgonzola cheese by following one simple direction—Sideways. It's the unique software program that lets you output all the spreadsheet columns you need, all on one continuous page, all with one print command—and all for only \$60!

With Sideways on your side, no spreadsheet you invent with Lotus 1-2-3™, VisiCalc® Multiplan™ or SuperCalc™ is too wide! And it's just as powerful an ally when you're creating far-into-the-future schedules and PERT charts with your word processor. In fact, for any wide text file, for dozens of uses, the way to go is Sideways.

The experts agree. PC Magazine, for example, writes: "If you've got the need, Sideways has the solution." And PC World calls Sideways "nifty . . . an easy to use program that does what it claims."

You can go Sideways today with an IBM® PC and an IBM® Epson, Okidata, Prism™ or Pro-writer™ printer. Ask for Sideways at your local ComputerLand® or other leading computer stores. Or mail a \$60 check to Funk Software, P.O. Box 1290, Cambridge, MA 02238. (617) 497-6339. MC/Visa accepted. Send no Mexican jumping beans, please.

SIDEWAYS™

FOR EASY-READING HARD COPY

CIRCLE 305 ON READER SERVICE CARD



DIAMOND DELIVERS!

The Total Solution
Full Service • Full Support
Low, Low Prices

This Month's Packaged Specials

Lotus 123/dBase III
AST 6 Pack 384K/
Framework \$689

Hayes 1200/Crosstalk
AST 6 Pack 384K/
Symphony \$869

NEW! Wordstar 2000
Dedicated word processor with windowing,
spelling corrector as you edit, math calculation,
on-screen bold, underline and footnote.

NEW! Wordstar 2000 Plus
All of the features of Wordstar 2000 plus a
built in mailing list, telecommunications and
automated indexing table of contents.

dBase III
Volkswriter Dix
Framework \$165
\$call

	LIST	SALE
Alpha Software® APPLE-IBM CONNECTION DATA BASE MANAGER II ELECTRIC DESK	\$250 \$295 \$345	\$139 \$call \$210
Ashton-Tate® GRAPE II FRISKY	\$495 \$295	\$269 \$159
Bentley International® TURBO PASCAL SIDEKICK	\$135 \$55	\$79 \$39
Comshare® CONDOR 3	\$600	\$319
Digital Research® PASCAL MT+ 86 CONCURRENT PC DOS CONCURRENT CPM 86 C BASIC 86 CPM 86 ACCESS MGR QUICKCODE PC DOS LANGUAGES	\$400 \$250 \$250 \$250 \$250 \$250 \$250 \$250 \$250 \$250 \$250	\$249 \$call \$135 \$135 \$79 \$249 \$249 \$249 \$249 \$249 \$249
Dynalyst® MARKET ANALYZER MARKET MANAGER	\$260 \$195 \$150	\$229 \$119 \$109
Emulex® FINANCER II TAX MILES	\$295 \$295 \$95	\$159 \$159 \$89
File & Color® QUICKCODE GRAPH GUTH QUICK REPORT	\$295 \$295 \$295 \$295 \$295	\$call \$call \$call \$call \$call
Powerbase Systems® POWERBASE	\$395	\$229 \$call
Harvard Software® HARVARD PROJECT MANAGER TOTAL PROJECT MANAGER	\$395 \$495	\$229 \$call

Crosstalk
Lotus 123
Multimate

	LIST	SALE
Howdast® TAX PREPARER Information Unlimited® EASYMAILER II GENERAL LEDGER ACCOUNTS RECEIVABLE ACCOUNTS PAYABLE INVENTORY CONTROL EASYWRITER II SYSTEM	\$100 \$100 \$595 \$595 \$595 \$595 \$595 \$595	\$59 \$30 \$call \$call \$call \$call \$195 \$395
Ultrix® LATTICE C COMPILER	\$600	\$269
Memo Data Base® KNOWLEDGEMAN	\$350 \$495	\$199 \$259
Monopack® WORDSTAR PRO PACK MAILMERGE CONCURRENT PLANSTAR SUPERSTORY II INFORMATION BURST TELMERGE CHARTSTAR PRO OPTION PACK	\$145 \$145 \$695 \$200 \$145 \$295 \$195 \$195 \$195	\$199 \$259 \$309 \$99 \$299 \$299 \$99 \$299 \$299
Monopack® WORD WORDHOUSE MULTITOOL FINANCIAL MULTITOOL BUDGET PASCAL COMPILER FORTY-NINE C COMPILER CHART PROJECT	\$175 \$175 \$175 \$200 \$200 \$200 \$200 \$200 \$200	\$139 \$229 \$69 \$99 \$229 \$229 \$229 \$229 \$229
Monopack® DOLLARS & SENSE Professional Software® WORD PLUS W/DOS	\$185 \$495	\$109 \$299

R:Base 4000
Multiplan
Symphony \$269
\$129
\$call

	LIST	SALE
Microsoft® CLOT EXTENDED REPORT WRITER	\$250 \$150	\$149 \$55
Prologix® PROKEY	\$495	\$259
Software Publishing® WORD PERFECT PFS FILE PFS REPORT PFS GRAPH PFS WRITE PFS PLAN	\$125 \$140 \$140 \$140 \$140 \$140 \$140	\$75 \$99 \$99 \$99 \$99 \$99 \$99
Sony® SUPERICAL 3 SUPERWRITER	\$295 \$295	\$259 \$259
Warner Software® WARNER DESK ORGANIZER	\$195	\$139
AST Research® 8 PAK PLUS-8AK REACH MODEM ALL OTHER AST PRODUCTS	\$295 \$295 \$295 \$295	\$259 \$259 \$259 \$259
Word® SMARTMODEM 1200 SMARTMODEM 1200B SMARTMODEM 2400	\$600 \$600 \$600	\$479 \$479 \$479
Quadrant® QUADLOCK I QUADLOCK II QUADBOARD EXP TO 384K	\$495 \$495 \$495	\$339 \$339 \$339
Metapack® GRAPHICS CARD COLOR CARD MEMORY (8AK)	\$495 \$495 \$495	\$339 \$339 \$339

- Special Corporate Incentives
- Cumulative/Quantity Discounts
- Same Day Shipping
- Overnight Delivery Available
- Purchase Orders Accepted From Qualified Organizations
- IBM, CPM, Apple® formats
- Expert Technical Assistance
- Full Product Guarantees
- Visa, M/C, Amex. Exp.
- Free UPS Surface w/PPD Check

TO ORDER
CALL TOLL-FREE
1-800-227-0545

Software Specialists
For The IBM PC

Diamond Software Supply

7916 Caswell Drive, Oakland, CA 94621

For price quotes, information, or in California call 1-415-633-2588. We credit your order for the call.

Technical Department (415) 633-2588. International Telex 338139 (attn. 149)

IBM is a trademark of International Business Machines

CPM is a trademark of Digital Research

Apple is a trademark of Apple Computer Inc.

We Deliver!

SOFTWARE

Alpha Software

ESF.....	\$529
Electric Desk (PC).....	\$209
Electric Desk (jr).....	199

Arrays Inc.

All Training Prog's ..ea \$ 49	
B&L	
Multi-job	\$145

ATI

All Training Prog's.....	ea \$ 49
--------------------------	----------

B&L

Multi-job.....	\$145
----------------	-------

BPI

Personal Acct'g.....	\$ 69
----------------------	-------

Borland

Disk Kick.....	\$ 37
Turbo Pascal.....	37

Cdex

All Training Prog's.....	ea \$ 49
--------------------------	----------

Central Point

Copy II PC.....	\$ 34
-----------------	-------

common language systems, inc.

PLAIN ENGLISH.....	\$499
--------------------	-------

CompuServe

Exec Info Service.....	\$ 69
------------------------	-------

CompuView - See Special

Connecticut Software

Printer Boss

w/ Letter Boss.....	\$ 79
---------------------	-------

Above w/ Side Kick.....	119
-------------------------	-----

Decision Resources

Sign-Master.....	\$255
------------------	-------

.....	195
-------	-----

dBASE CORNER

Anderson-Bell

Abstar.....	\$289
-------------	-------

Ashlan-Tate

d-Base II.....	Call
----------------	------

d-Base III.....	Call
-----------------	------

Framework.....	Call
----------------	------

Friday.....	Call
-------------	------

Fox & Geller

d-Graph.....	\$169
--------------	-------

Quick Code.....	169
-----------------	-----

Quick Report.....	169
-------------------	-----

d-UI.....	58
-----------	----

Human Soft

db Plus.....	\$ 85
--------------	-------

(All above available on PC-DOS.)

Digital Marketing

Grammatik.....	\$ 60
----------------	-------

Proofreader.....	42
------------------	----

Digital Research

Avail in CP/M or PC-DOS:

Fortran 77.....	\$345
-----------------	-------

Pascal MT+.....	Call
-----------------	------

C Compiler/Long.....	340
----------------------	-----

Display Mgr.....	245
------------------	-----

Access Mgr.....	275
-----------------	-----

DR Assem & Tool.....	140
----------------------	-----

DR Graph.....	135
---------------	-----

Concurrent.....	240
-----------------	-----

Avail CP/M only:

C Basic-86 Interp.....	140
------------------------	-----

CP/M-86.....	49
--------------	----

Personal Basic.....	105
---------------------	-----

Speed Programming

Package (SPP)

For Pascal MT+.....	140
---------------------	-----

Dow Jones

Spreadsheet Link.....	\$179
-----------------------	-------

Home Budget.....	89
------------------	----

Ecosoft, Inc.

Microstat.....	\$239
----------------	-------

Emerging Technology

Edits (editor).....	\$139
---------------------	-------

Wordix (formatter).....	139
-------------------------	-----

Prof Writers' Pkg.....	389
------------------------	-----

Enertronics

Energraphics.....	\$219
-------------------	-------

w/ Plotter Option.....	279
------------------------	-----

FYI

Superfile.....	\$149
----------------	-------

FYI 3000.....	287
---------------	-----

Fastware

Thor (the thought organizer).....	\$245
-----------------------------------	-------

Financier, Inc.

Financier II.....	\$119
-------------------	-------

Tax Series.....	105
-----------------	-----

Fox & Geller

Grafco.....	\$169
-------------	-------

R-Graph (for R-base 4000).....	\$175
--------------------------------	-------

Harvard Associates

PC Logo.....	\$ 99
--------------	-------

Harvard Software

Project Manager.....	\$249
----------------------	-------

Hayes

Smartcom II.....	\$ 95
------------------	-------

Please.....	Call
-------------	------

Heritage

Smartkey II+ (w/Print).....	\$ 75
-----------------------------	-------

Howard Soft

Tax Preparer.....	Call
-------------------	------

HyperGraphics Corp.

Authoring Graphics.....	\$299
-------------------------	-------

Presentation Graphics.....	279
----------------------------	-----

HyperGraphics Corp.

(continued)

Object Libraries:

Computer Aids.....	\$ 49
--------------------	-------

Maps.....	49
-----------	----

Borders.....	49
--------------	----

Individual Software

Prod. DOS.....	\$ 47
----------------	-------

Prod. Pixel.....	47
------------------	----

LOTUS 1-2-3 CORNER

Programs for your LOTUS 1-2-3

Consumer Software, Inc.

'Auditor' (proof- ing tool).....	\$ 85
----------------------------------	-------

Lighthouse Software

Key II (Data Mgmt for 1-2-3).....	\$149
-----------------------------------	-------

National Training Systems, Inc.

Putting 1-2-3 To Work (8 application tem- plates on diskette).....	\$ 79
--	-------

Phase Two Software

The Tool Kit (30 worksheet files).....	\$ 30
--	-------

Strategic Software Systems, Inc.

Bottomline V.....	\$195
-------------------	-------

Innovative Software

Fast Graphs.....	\$229
------------------	-------

Lifetime Software

Volkswriter Deluxe.....	\$155
-------------------------	-------

Volkswriter Scientific.....	359
-----------------------------	-----

Living Videotext

Think Tank (256K).....	\$119
------------------------	-------

MDBS, Inc.

Knowledge Man.....	\$275
--------------------	-------

K Graph.....	179
--------------	-----

K Text.....	129
-------------	-----

K Paint.....	79
--------------	----

Menlo Corp.

In-Search.....	\$299
----------------	-------

MicroPro

WS ProPack (WS, CS, MM, SI).....	\$275
----------------------------------	-------

WordStar.....	175
---------------	-----

WordStar 2000+.....	289
---------------------	-----

Wordstar 2000+.....	349
---------------------	-----

Pro Options Pak.....	109
----------------------	-----

ProPlus Plus (WS, CS, MM, SI, TM).....	\$369
--	-------

TeleMerge.....	109
----------------	-----

Microim

R-Base.....	\$279
-------------	-------

R-Base Clout (2.0).....	139
-------------------------	-----

Report Writer.....	95
--------------------	----

Microsoft

Chart.....	\$159
------------	-------

MultiTab/MuSimp (DOS).....	179
----------------------------	-----

Pascal Comp (DOS).....	199
------------------------	-----

Project.....	169
--------------	-----

C Comp (MS DOS).....	319
----------------------	-----

Basic Comp (MS DOS).....	249
--------------------------	-----

Multiplan 1.20 (MS/DOS).....	\$129
------------------------------	-------

Word 1.15 (DOS).....	229
----------------------	-----

Word w/ Mouse.....	299
--------------------	-----

Others.....	Call
-------------	------

Microsoft

Crosstalk.....	\$ 99
----------------	-------

Remote.....	Call
-------------	------

Morgan Computing

Professional Basic.....	\$ 99
-------------------------	-------

Trace 86.....	79
---------------	----

Multimate Systems, Inc.

Multimate (Vers 3.3).....	\$289
---------------------------	-------

North American

Memory Shift.....	\$ 79
-------------------	-------

Northwest Analytical

Statpak.....	\$365
--------------	-------

Oasis

Word Plus.....	\$110
----------------	-------

Punctuation & Style.....	99
--------------------------	----

Open Systems

Acct'g Programs.....	\$419
----------------------	-------

Buy 3 or more @.....	399
----------------------	-----

Opt-Tech

Data Processing

Sort.....	\$ 79
-----------	-------

Pal Software

Artipak (PC, XT, Jr).....	\$ 75
---------------------------	-------

Peachtree Software

Back to Basics

Acct'g System.....	\$219
--------------------	-------

Peachpak 4

[IGL, AP, AR].....	\$229
--------------------	-------

Series 8, ea. mod.....	359
------------------------	-----

Peter Norton

Utilities.....	\$ 50
----------------	-------

PowerBase Systems, Inc.

Power-base w/ DATAZOOM.....	\$259
-----------------------------	-------

Prémise Hall

VCN Excursion.....	\$259
--------------------	-------

Samma Corp.

Word III.....	\$349
---------------	-------

SPI Open Access.....	\$319
----------------------	-------

Satellite Software

Data (sm data base).....	\$139
--------------------------	-------

Word Perfect w/ Sp.....	255
-------------------------	-----

Others.....	Call
-------------	------

PCjr.

Please call us regarding products for the IBM PCjr.

Softcorp, Inc.

PRO-ECT 4

(Complete Critical Path Mgmt Syst.)..... Call

Softcraft

Fancy Fonts (V 2.0).....	\$125
--------------------------	-------

Software Arts

TKI Solver.....	\$265
-----------------	-------

Spotlight.....	109
----------------	-----

Software Publishing

PFS: Access, Proof.....	\$ 59
-------------------------	-------

PFS: File, Graph,

Plan, Write.....	89
------------------	----

PFS: Report.....	79
------------------	----

Star Software

Accounting Partner.....	219
-------------------------	-----

Acct'g Partner II.....	599
------------------------	-----

Supersoft

Disk Doctor.....	\$ 69
------------------	-------

Fortran.....	299
--------------	-----

BOARDS

DISPLAY CARDS

Amdel	
MAI Card.....	\$399
Fredericks/Plantronics	
ColorPlus.....	\$399
Heraules	
Graphics Board.....	\$339
MA Systems	
Peacock Cir Bd.....	\$249
Paradise	
Display Card (c/v/monochrome).....	\$349
Modular Display Card.....	\$309
Quadram	
Quadcolor I.....	\$199
Quadcolor II.....	\$389

AST Research	
5x Pix Plus 64K (S&P, Clk, exp to 85C).....	\$265
MegaPlus 64K, (C/Cl, 5 Port, 512K cap w/ Megapack).....	\$269
Extra ports for Mega-plus and I/O Plus II (Game, P or S).....	\$ 40
MegaPack 256K exp.....	Call
I/O Plus II (C/Cl, 5 Port).....	\$159

New AST to IBM Mainframe connection now available:	
5251 - SNA - BSC - 3780 - PCOX.....	Call
Monograph Plus.....	Call
BYAD, Inc.	
D511 (2/80, 64K Ram, Ser Port, DR-CP/M 2.2) Call	
ByWay 100 (Micro to Mainframe 2/80, 64K) Call	
ByWay 200 (Sophisticated Micro to Mainframe, 2/80, 64K) Call	
Maynard Electronics	
Floppy Drive Contr.....	\$119
w/ Par Port.....	169
w/ Ser Port.....	179
Sandstar.....	Call
Orange Micro	
Mc Chips.....	\$369

Quadram	
Quadboard 64K, (exp 384K, Clk/Col, S&P).....	\$269
MicroLaser Stack Printer P/P 8K.....	\$139
S/P 8K (exp 64K only).....	149
S/S 8K (exp 64K only).....	149
Quadlink 64K Mem.....	\$469
All Other Products.....	Call
Tecmar	
Graphics Master.....	\$479
Captain's Bd/w 64K.....	299
1st Mate.....	259
2nd Mate.....	250
3rd Mate.....	379
Jr. Captain (28K, C, P).....	329
Jr. 2nd Mate (C, P).....	129

PC NETWORKING

(Please call for configurations and prices.)

AST Research	
PC 002 NET Starter Kit.....	\$899
Corvus.....	Call
Onidrid Technologies	
The "Orchid Blossom" board (to 384K, Clk, w/ alarm, S&P ports, ram disk & disk caching, upgradeable to PCNet).....	Call
Quadram.....	Call
Add'l Networking Products.....	Call

MONITORS

Amdel	
300A Amber.....	\$149
310A.....	\$265
300 Clr.....	385
500 Clr RGB.....	455
600 Clr HR.....	535
600 Clr Ultra HiRes.....	535
NEC	
J1201-12" Green.....	\$169
J1260-12" Green.....	119
J1216 RGB.....	429
PGS	
HX12 RGB Color.....	\$489
MAX 12.....	189
Quadram	
Quadchrome.....	\$489
Sanyo	
B112 12" HR Green.....	\$195

USI 1200A	
12" HR Am.....	\$139
Zenith.....	Call

ULTRA HI-RES MONITORS

PGS	
SR 12 (690 x 480 Pels).....	\$639
Double Card for SR-12.....	\$175
Tuxon	
RGBvision 440 (720 x 400 Pels).....	\$675
Feryst	
BoB Bd for 440.....	\$475

MODEMS

Hoyes	
Smartmodem 300.....	\$195
Smartmodem 1200.....	475
Smartmodem 1200S.....	399
Microcom, Inc.	
Era 42 (1200 int baud).....	\$395
Navation	
Quadram Quadmodem (Stand alone, full 212A, compatible w/ Quadlink SW).....	\$529
US Robotics	
Auto-Dial 300/1200.....	\$459
S-100 Modem.....	349
Password.....	325
Ventel	
300-1200 baud Modem w/ Crastalk for portables.....	\$459

DISK DRIVES

Mountain, Inc.	
FileSafe Combo Disk/Tape Pack for the IBM PC or XT Model 01-4000-04: 35MB HD w/ 27MB tape back-up	
Model 01-4000-06: 35MB HD w/ 60MB tape back-up	
For more info.....	Call

CDC 1800.....	\$179
Corvus HD.....	Call
I-Omega	
Bernoulli Box.....	Call
Maynard HD.....	Call
Talgrass.....	Call
(for Wisconsin customers)	
Tandon TM-100-2.....	\$175

PRINTERS

C. Itoh Electronics	
Printer	
8510 AP (Por).....	\$349
8510 PC-II (Ser) (w/ 32K Buffer).....	499
1515P.....	599
Starwriter	
F10 40P (40 cps).....	999
A10-205 (20 cps).....	529
Dialo	
630 ECS.....	Call
630 API.....	Call
Juki 6100.....	\$399
Manneeman Tally.....	Call
NEC 3550.....	Call
Okidata 82-93.....	Call
Quadram Quadjet.....	Call
Siemens Ink Jet Printers PT88.....	Call
Silver Reed	
500P (P or S) (16 cps letter quality).....	\$395
EXP 770P (P or S) (36 cps, 2K buffer, letter quality).....	899
Star Micronics.....	Call
..... and much more.	

DISKETTES

3M 5 1/4" DS, DD (Box/10).....	\$ 35
Maxell	
MD2-HD (diskettes for the IBM PC-AT, Box/10).....	\$ 69
Ultramagnetics	
5 1/4" DS, DD (Box/10).....	\$ 32
Verbatim	
5 1/4" DS, DD (Box/10).....	\$ 32

PLOTTERS

Amdel	
DXI-100.....	\$599
Amplifier II.....	899
Enter	
Sweet P Six Shooter.....	Call
Houston Instruments	Call

MISC.

Alpha-Delta	
MACC B Surge Protector.....	\$ 69
Computer Accessories	
P12 IBM PC.....	\$145
P22 Stand Alone.....	75
Electronic Protection Devices	
Lemon / EC-I.....	\$ 38
Lime / EC-II.....	55
Orange / EC-IV.....	75
Flip 'n' File 5 1/4".....	\$ 22
Hauptpage	
8087 Chip.....	\$159
80787 AT Chip w/o att 289	
Other Products.....	Call
Kensington Microwave Masterpiece.....	\$109
Key Tronic	
KB 5150.....	\$169
KB 5151.....	175
KB 5151 Dvorka.....	175
Microsoft Mouse.....	\$155
Mouse Systems	
PC Mouse.....	\$159
RH Electronics, Inc.	
Guardian Angel.....	Call
Power Angel (800w).....	Call
Titan Technologies, Inc.	
PC Accelerator.....	Call
TG Joystick.....	\$ 49
Touchstone Technology	
Touchstone I (add-on keypad for the IBM).....	\$169
Versa Computing	
WriteWriter.....	\$239

For assistance in determining your needs, use our technical line! We will be happy to provide full support.

POLICY:

- ▶ Wisconsin residents add 5% for sales tax.
- ▶ Minimum \$4.00 for shipping, handling and insurance for orders to \$200.
- ▶ For orders over \$200, add 2 1/2% for shipping, handling and insurance.
- ▶ For cash prepayment of orders \$200 or more, add ONLY 2% for shipping, handling and insurance.
- ▶ Foreign — either add 15% handling & shipping (Int'l money order) or inquire.
- ▶ Prices are subject to market fluctuations.
- ▶ All items subject to availability.

WE WELCOME:

- ▶ Visa, MasterCard and American Express. (No charge for credit cards.)
- ▶ Corporate, government or educational volume purchases, please ask for special accounts desk for additional discount. (1-715-848-1374)
- ▶ COD (Add \$2.00 per box/parcel. Cash or certified check required.)
- ▶ Checks. (Allow 1-2 weeks for clearing.)

WORKING HOURS:

Monday-Friday 8:30-6:00 • Saturday 10:00-2:00 (Ordering Lines only) • Central Time
For tech. support, order status and customer service, call (715) 848-1374 (M-F, 8 am to 5 pm)
CIRCLE 351 ON READER SERVICE CARD
CIRCLE 363 ON READER SERVICE CARD FOR SPECIAL OF THE MONTH

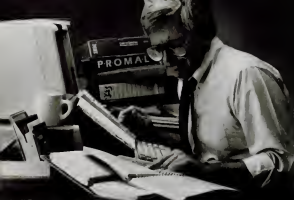
ORYX SYSTEMS, INC.
CRAFTSMEN OF THE NEW TECHNOLOGY

1 800 826-1589

WITHIN WISCONSIN **1 800 472-3535**

425 First Street • P.O. Box 1961
Wausau, Wisconsin 54401
INT'L TELEX: 260181 ORYX SYS WAU





Instead of this...



...you can have this

with this!



\$14.95

Why waste time digging through cumbersome manuals for operating commands? PC-DocuMate™ templates put computer commands at your fingertips for the IBM® PC, PC-XT, Compaq®, Apple® IIe and Commodore® 64.

You'll have quick reference for needed commands, options and formats right on your keyboard with a PC-DocuMate template.

Our professionally designed, two-sided templates are made of durable, non-glare plastic. Satisfaction is guaranteed—fully—or your money back.

Templates Now Available—
IBM PC/XT and COMPAQ:
 DOS/BASIC (2.0 & 2.1) • 1-2-3 •
 Symphony • dBASE II • dBASE III
 • Framework • MultiMate
 • Wordstar • EasyWriter II •
MULTIPLAN (IBM or Microsoft) •
 PeachText 5000 • SUPERCALC³
 • VisiCalc • TURBO Pascal •
 WordPerfect • VOLKSWRITER
 DELUXE • Do-It-Yourself.

PCjr: DOS/BASIC 2.10 • dBASE II
 • Do-It-Yourself.

COMMODORE 64 (Single-sided):

C-64 BASIC • EasyScript •
 CalcResult • Do-It-Yourself.

Apple IIe: AppleWriter II •
 WordStar • VisiCalc • dBASE II
 • Quickfile • Do-It-Yourself.

How to Order:

To order by credit card call toll free
1-800-762-7874

(In NC call 919-787-7703)

Or mail us your personal check, money
 order or MasterCard/Visa information.

NC residents include 4.5% sales tax.
 Please add \$1.50 for shipping and
 handling per order. (Foreign orders,
 except Canada, add \$15.00 per order).
 U.S. funds only. No CODs.

*Our Guarantee: Use your template for
 20 days. If you are not completely
 satisfied return it to us (undamaged)
 for a full refund.*

SMA

Systems Management Associates
 3700 Computer Drive, Dept. B-9
 Raleigh, North Carolina 27609

THE PROFESSIONAL'S CHOICE

Lotus 1-2-3 \$299	Lotus Symphony \$419	dBase III \$339	FrameWork \$339	MultiMate \$259	WordStar 2000+ \$319
-------------------------	----------------------------	--------------------	--------------------	--------------------	----------------------------

Software

Word Processing Editors

EASYWRITER II	\$219
FANCY FONT	\$139
FINAL WORD	\$189
MICROSOFT WORD	\$239
MICROSOFT WORD W/MOUSE	\$299
MULTIMATE	\$259
PFS: WRITE	\$ 95
SAMNA WORD III	\$299
VOLKSWRITER	\$159
DELUXE	
VOLKSWRITER	
SCIENTIFIC	\$309
THE WORD PLUS (OS/2)	\$105
WORD PERFECT	\$249
WORDPLUS W/MOUSE	\$319
WORDSTAR	\$219
WORDSTAR 2000	\$289
WORDSTAR 2000+	\$299
WORDSTAR	\$259
PROFESSIONAL	\$229
KYWRITE II	

Spreadsheets/Integrated Packages

ELECTRIC DESK	\$269
ENABLE	\$459
FRAMEWORK	\$339
LOTUS 1-2-3	\$299
MULTITRAN	\$139
OPEN ACCESS	\$299
SMART-SHEET	\$359
SUPERCALC 3	\$ 79
SYMPHONY	\$419
TKI SOLVER	\$299

Desktop Environments

DESK ORGANIZER	\$129
GET ORGANIZED	\$129
SHORCUT	\$ 45
SPOTLIGHT	\$169

Communications/Productivity Tools

CROSSTALK	\$169
PROKEY	\$ 99
RELAY	\$ 99
SMARTCOM II	\$169

Databases Systems

ALPHA DATA BASE MANAGER II	\$179
CLOUD V 2.0	\$139
CONCOR II	\$299
DBASE III	\$239
INFOSTAR	\$219
KNOWLEDGEMAN	\$299
PFS: FILE/PFS	
REPORT	\$199
POWERBASE	\$219
QUICKSCOPE III	\$259
R 345E 4000	

Language/Utilities

CONCURRENT DOS	\$199
CIN C-COMPIER	\$299
DIGITAL RESEARCH C-COMPIER	\$219
FORTRAN 77	\$219
LATTICE C-COMPIER	\$349
MICROSOFT C-COMPIER	\$309
MS BASIC COMPILER	\$249
MS FORTRAN	\$239
NORTON UTILITIES-NEW	\$ 59
TURBO PASCAL	\$45

Project Management

HARVARD PROJECT MANAGER	\$219
HARVARD TOTAL PROJECT MANAGER	\$299
MICROSOFT PROJECT	\$159
SCITON PROJECT	\$299
5000 W/GRAPHICS	

Professional Development

MANAGEMENT EDGE	\$159
SALES EDGE	\$159
THINK TANK	\$119

Home/Personal Finance

DOLLARS AND SENSE	\$119
FINANCER II	\$119
HOWARD TAX	\$199
PROFESSIONAL 95	\$199
MICRO TAX	\$ 99
MANAGING YOUR MONEY	\$129

Graphics/Statistics

ABSTAT	\$279
AUTOCAD	\$139
RPS BUSINESS GRAPHICS	\$299
CHARTMASTER	\$239
CHARTSTAR	\$239
ON DRAW	\$199
ENERGRAPHICS W/ PLOTTER	\$279
EXECUTION GRAPHWINTER	\$259
COMBO	\$389
MS CHART OVERHEAD	\$159
EXPRESS	\$139
PC DRAW	\$219
PC PAINTBRUSH	\$ 99
PFS: GRAPH	\$179
SIGNMASTER	\$179
STATPAC	\$219
STATPAC-HWA	\$239
STATPAC-WALONICK	\$299

Accounting Modules

BPI	\$229
GREAT PLAINS	\$479
RUE'S BUSINESS MGR.	\$269
OPEN SYSTEMS	\$399
PEACHTREE	\$269
REAL WORLD	\$499
STATE OF THE ART	\$389
STAR ACCOUNTING PARTNER II	\$249
STAR ACCOUNTING PARTNER II	\$599

Hardware *

Multifunction Boards

AST ADVANTAGE	\$549
AST 9 PAK PLUS (54K)	\$249
AST 9 PAK PLUS (384K)	\$449
AST MEOPARUS II (84K)	\$349
QUADBOARD (256K)	\$269
QUADBOARD (256K)	\$299
QUADBOARD EXP. (84K)	\$269
QUADBOARD EXP. (384K)	\$499
QUAD 512 + (84K)	\$299
ORCHID BLOSSOM	\$349
PERYST	\$299
TECMAR CAPTAIN (84K)	\$279
TECMAR WAVE (84K)	\$269

Display Boards

AST MONOGRAPH PLUS	\$349
EVEREX GRAPHICS	\$419
EDGE	\$419
HERCULES GRAPHICS	\$329
HERCULES COLOR	\$179
PARADISE MOODULAR	\$269
PARADISE MOODULAR	\$269
PERYST	\$349
PLANTRONICS	\$349
PRINCETON SCAN	\$149
COULBER	\$149
STB GRAPHICS	\$309
PLUS II	\$309
TECMAR GRAPHICS	\$449
MASTER	\$259
TECMAR VIDEO VAN	\$449
OGON	\$259
TSENO ULTRA PAK	\$449

Displays

AMDEK 3950/396A	\$139-149
AMDEK 315A	\$179
AMDEK COLOR II +	\$459
PRINCETON HX-12	\$469
PRINCETON MAX-12	\$179
PRINCETON SR-12	\$149
QUADRAM	\$149
AMBERCHROME	\$149
ZENITH 134 AMBER	\$149
ZENITH 135 COLOR	\$149

Modems

AST REACH 1200	\$459
HAYES 1200	\$459
HAYES 2400	\$459
VERTEL 1200	\$459
HALF CARD	\$149

Accessories

CURTIS BURGE PROTECTORS	\$349
EPO SURGE PROTECTORS	\$349
OLYTRONIX A/B SWITCH	\$349
MICROBUFFER INLINE	\$249
MICROFAZER INLINE	\$219
54K RAM SET	\$40
256K RAM SET	\$150
SOFT MATH	\$150

Printers/Plotters

AMPLIT II	\$699
C. ITOH	\$549
COMWRITER II	\$549
COMWRITER 420	\$549
DIABLO 820/830	\$549
EPSON FX-100	\$549
EPSON LO-1600	\$549
EPSON JX-80	\$419
JUNI 8100	\$419
NEC P3	\$419
NEC 2860	\$419
NEC 3150	\$1399
OKIDATA 64P	\$729
OKIDATA S3P	\$619
OKIDATA S3P	\$619
TOSHIBA P1151	\$1399
SWEET'S 8 PEN	\$1279
PLOTTER	\$699

Emulation Boards

ASTPC	\$649
AST 3790	\$649
AST SNA	\$649
AST 80	\$649
BLUE LYNX	\$649
CI 3278/9	\$649
IRMA	\$649
IRWALINE	\$649
IRMAPRINT	\$649
QUAO 3278	\$649

Input Devices

KETTERNICH 5151	\$199
IRMA	\$199
MOUSE	\$139
PC MOUSE W/PAINT	\$159

Mass Storage

ALLOY PC-BACKUP	\$1649
ALLOY PC-DISC	\$1799
2MB	\$2999
10MB	\$2999
WATNARD WS-1 10MB	\$2999
SIGMA	\$2999
SYSGEN IMAGE	\$2999
TALLGRASS HANDFILE + TAFE	\$159
TEAC HALF HEIGHT	\$159

Networks

AST PC NET	\$349
CONVEX NET	\$349
DIGITAL RESEARCH	\$1199
ORCHID PC NET	\$349

*CALL FOR SHIPPING COSTS

Samna Word III \$CALL	Chart-Master \$239	AST 6 Pak Plus \$249	Quad Board Expanded 64K \$269	Smartmodem 1200B \$399	Smartmodem 1200 \$459
-----------------------------	-----------------------	----------------------------	-------------------------------------	------------------------------	-----------------------------

FREE SHIPPING
on all credit card or prepaid orders
and all orders over \$1000

LOWEST PRICE GUARANTEE!!

We will match current nationally advertised prices on most products. Call and compare.

free!
Diskette Library Case with your order



1-800-221-1260

In New York State call (718) 438-6057

TERMS:
Checks—allow 14 days to clear. Credit processing—add 3%. COD orders—cash, M.O. or certified check—add \$3.00. Shipping and handling UPS surface—add \$3.00 per item (UPS Blue \$5.50 per item). NY State Residents—add applicable sales tax. All prices subject to change.

MON.-THURS. 9:00AM-8:00PM
SUN. & FRI. 9:00AM-4:00PM

Softline
Softline Corporation
P.O. Box 729, Brooklyn, N.Y. 11230
TELEX: 421047 ATNL UN



Draw Your Way to the Top

*PC-Draw Will Increase Your Office Productivity.
And Upward Mobility.*

Imagine. You now have the capability to graphically depict your best ideas, plans, designs and proposals. *In color or black & white.* Accurately. Completely. Dramatically. Concepts presented so forcefully—yet so simply—that you leave that critical meeting with upper management... *totally* confident of success.

And you win. Your secret weapon? PC-Draw. A powerful interactive graphics program for the IBM PC or XT[™]—*unlike anything else* on the market. Using PC-Draw you create virtually anything that can be drawn with pencil and paper. Quickly. Easily. With far greater detail.

PC-Draw is ideal for presentation graphics, proposals,

**10 DAY
TRIAL
PERIOD**

systems design, forms, diagrams... and an endless variety of charts, graphs and illustrations. PC-Draw allows you to produce drawings *up to 99 pages* long. Several templates come with PC-Draw including Flowcharting, Electrical Design, Office Layout, and Alternate Text. In addition you create and store your *own* unlimited supply of user defined symbols.

PC-Draw includes an *easy-to-follow* interactive tutorial. Requires IBM PC or XT[™] or compatible, graphics adapter and graphics monitor. Version for PCjr available. Graphic boards, plotters at competitive prices.

Shhh! Don't tell your office competition about PC-Draw. They'll catch on soon enough. For free brochure or to order call 800/2PC-DRAW. In Texas or for customer service call 214/234-1769. Micrografx, Inc., 1701 N. Greenville Ave., Suite 305, Richardson, Texas 75081.

MICROGRAFX

The Picture of Success.

(Most popular plotters and printers supported.)

CIRCLE 311 ON READER SERVICE CARD

The Interactive Reader

PC is becoming more than a magazine. With our new Interactive Reader System electronic bulletin board, we're finding new ways to reach out to you and let you reach back to us.

When I was a freshman in college, I remember talking in a history course about the convenient ways that we pigeonhole history: the Iron Age, the Industrial Age, the Victorian Age. Professor Ultan played mind games with us, asking questions about our perceptions of the 20th century. "What," he asked, "would you call our age?" "The Nuclear Age," suggested one student. "The Electronic Age," said another. "The Age of Reason," said I. "Every age considers itself the Age of Reason," observed Professor Ultan.

The writers of future history are still finding names for our age, many more than those which came up in Professor Ultan's brainteasing session. One that didn't occur to us then was the Information Age. This label is firmly rooted in computer technology and in the belief that every hut in the global village soon will be able to tap into vast stores of organized data. The theorists also foresee a new role for printed media, especially newspapers and magazines, when electronic distribution becomes a reality.

Like the reports of Mark Twain's death, the claims for these technologies have been greatly exaggerated. The number of people for whom electronic publishing is viable is still small, a select group of information junkies. We haven't joined this select group yet, not

because we're a bunch of antiprogressive Luddites, but because we pick and choose our electronic ventures with care. We have to be able to demonstrate a tangible benefit to you, the reader.



Bill Machrone

In this spirit, we're taking you to an editorial lunch. A hot joke at last fall's COMDEX was, "Have your modem call my modem—let's do lunch." We invite you to do the same, but not for a meal. For you, PC reader, the reward is software. You can now call the *PC Magazine* Interactive Reader System. At its heart, it's an electronic bulletin board. In practice, we hope it will be much more. On it, you'll find all the program listings in every issue of *PC* since the beginning of the year. That's right—our Programming

columns, User-to-User columns, keyboard macros, and so on. We've also included selected programs from earlier issues and other goodies. We put them directly from disk to bulletin board, avoiding tedious, error-fraught rekeying. Look for the telephone number at the bottom of the masthead, in the opening pages of the magazine, and in the technical articles.

We're starting small, with just one incoming phone line. In the wings is an extensive multi-user system that can handle a half dozen or more callers at a time. We'll let the phone traffic help us determine when to put it to work. The system will be available 24 hours a day. If you can't get through, wait a while and try again. At times, a recorder on a bounce line will simply count the number of times the system is busy and someone else tries to reach it. You'll also be able to leave messages, letters to the editor, and comments on the system.

To create another forum in which some of you can talk back, we have joined forces with Dean Meyer and Associates, a consulting firm with a good reputation in the office automation field. Throughout 1985, we will cohost a series of teleconferencing seminars. The participants will be medium-to-large businesses here and abroad that use PCs as workstations and productivity tools. The

Introducing a complete internal half- high 60 megabyte tape backup system for your IBM® PC, XT, \$995 or AT for only

Complete with tape drive, controller, and software

And it works easily with all IBM compatible operating systems. Simply tell your tape drive you want to backup or restore the entire hard disk, or any file, or backup or restore by subdirectory, date, or everything since you last backed up.

Now you won't have to wait for the difficult to find hard-disk version of the IBM AT (model 99). You can buy the floppy disk IBM AT (model 68), add our hard disk and tape drive system for about what you'd pay for the AT hard disk upgrade alone. It's almost like getting the tape drive free.

Let's face it, we've all heard the horror stories of people who've lost data on their hard disk. True, it doesn't happen often, but then disaster seldom does. With the amount of data you can put on a hard disk these days, no one in business can afford even a small disaster.

When did you last backup your hard disk?

Oh, you did it once with floppies

and it was so time consuming that now you've convinced yourself nothing will go wrong? In other words, it can't happen to you. And besides, at the prices they're asking for tape backup—\$2,000 and up—you're willing to take a chance. You've seen some tape drives for less, but you have to buy an expensive hard disk to go with it, and you've already got a good hard disk. Where can you turn for relief?

IBM Compatible tape drive system complete for \$995

The Express Systems™ tape drive comes complete—half-high tape drive, controller, and software—for only \$995. It's absolutely IBM compatible—all 60 megabytes of it.

You can use your tape drive in the event your hard disk fails. And if you have to replace your hard disk, the tape's ability to read bad sectors will let you replace your hard disk with another even if the new one is not error-free. The tape requires very low power, too.

And it doesn't poke along. It reads and writes at 90 inches per second (ips) and transfers data at up to 3.75 megabytes per minute in the streaming mode. You don't have to be a rocket scientist to figure that you can perform an image backup of a 20 megabyte hard disk in about 5 minutes. But practically speaking, once you back up your hard disk completely for the first time, you never need to do more than invoke the archive command—that convenient command that tells your new tape drive to backup everything since you last backed up. If you back up as often as you should, your Express Systems tape drive will finish the job virtually in seconds.

The Express Systems software has additional benefits, like enabling you to use PC DOS terminology such as "...", "...", and "...". It also has a built-in reformatter, built-in verification (to make sure you transferred what you thought you did), and it's prompt driven, which means it asks you exactly what you want to do.

Easy to install

Before you get intimidated about installing our tape drive internally, you should under-

stand that IBM doesn't think it's too difficult. They're selling IBM PC ATs with instructions on how to add additional hard disks in the *Installation and Setup* manual that comes with the AT.



The IBM AT installation manual shows how easily you can install internal storage drives yourself.

Our instructions for installing your new Express Systems tape drive follow IBM's clear, simple instructions.

We even provide the tape cartridge

Most people don't realize that the tape cartridge contains most of the critical mechanisms to insure data integrity. In order to be sure that you get the best insurance for your data (after all, isn't that why you're buying it?) we encourage you to use Express Systems' specially tested tape cartridges. We're not going to kid you and tell you others won't work, but here's what's special about Express Systems' tape cartridges.

First, they are tested down to four separate tracks from end-to-end, not just down the center of the first 150 feet, like some others do. We use three screws to hold the cover on instead of four. This simple triangular arrangement keeps the base-plate flat, just like three legs work better than four to make a table steady. Since all tape drives reference everything to the base-plate, this alignment is critical. We also use special rollers to dissipate static electricity buildup—something that can ruin your whole day.



The Express Systems tape drives come with Express Certified™ 555 or 600 1/2-inch tape cartridges with quadruple end-to-end testing for extra insurance of your data.

And finally, we will sell you tape cartridges in boxes of three instead of the usual five. So, you get higher quality with a smaller quantity commitment. And we compound the savings with a lower per unit price, just \$35.00 instead of the usual \$45.00 most retailers charge.

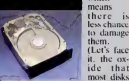
IBM

IBM

Need a hard disk?

Depending on whether you have an IBM PC, XT, or AT you may want additional hard disk storage. We have those too. We offer 10, 21 and 31 megabytes of formatted hard disk storage.

For the most part, our drives are made with plated media,



which means there is less chance to damage them. (Let's face it, the oxide that most disks come with is nothing more than rust.) We then test the drives, pre-format them, and install DOS 3.0 so that you're ready to begin transferring files. We even include DOS 3.0 documentation.

And they're 100 percent IBM compatible. The controller we send you for the XT is an upgraded version of the XT controller from the same company that makes the XT controller. In fact, the Express Systems controller is an improved controller which requires less power so that it is more reliable than any other standard controller.

But from a mail order house?

We provide the power too.

If you want to upgrade your IBM PC, there just isn't any way around upgrading your power supply—if you want to have

true XT or better capability. Some companies say that their hard disks don't require any increase in power—and they might be right. But don't add anything to your slots, because the minute you do, you'll need more power. That's the bad news.

The good news is that our power supplies are inexpensive. How's \$99.50 for an XT power supply? We mean a full 130 watts of power. The other good

Express Systems Upgrade Kits

(Includes controller, software, and cable where appropriate)

IBM AT (model 99) to AT ExPlus™

1 half-high tape drive system

\$995

IBM XT to XT ExPlus

1 half-high floppy and 1 half-high tape drive system

\$1095

IBM AT (model 68) to AT ExPlus

21 Megabyte upgrade

1 half-high 21 megabyte hard disk with half-high tape drive system

\$1895

31 Megabyte upgrade

1 half-high 31 megabyte hard disk with half-high tape drive system

\$2195

IBM PC to XT ExPlus

2 half-high floppies, 1 half-high 10 megabyte hard disk with controller, 1 half-high tape drive system and 130 watt power supply

\$2095

news is that it's held in by only 4 screws. Express Systems power supplies can be changed in 20 minutes, a small price in time for the peace of mind to convert your PC to an XT-capable machine and avoid the unsightly "wart-like" power supply add-ons that some companies insist you paste on the back of your PC.

But from a mail order house?

We get tired of the snide remarks some people make about mail order houses. The comments are usually spread by distributors and retailers who are getting cut out of 15 and 35 percent margins, respectively. If we went through distribution—you'd have the privilege

of paying for large glass windows, rugs, salesmen, etc.—but we'd also be selling this tape drive for \$1495.

We're not criticizing distributors and retailers. They perform a valuable service. But you don't need them if you know what you want. And you can

certainly install it yourself. IBM has proved it with their instructions for self-installation that come with the new IBM PC AT.

And speaking of IBM, the next time you hear anyone criticize mail order as a way to buy computer equipment, remind them that IBM is now in the mail order business.

Warranty

We offer you a one year warranty on our hard disks—the same as IBM on the AT and 90 days on the tape drives. (It's all the manufacturer gives us.) If anything goes wrong with your tape or disk drive or hard disk, send it back in the box it came in. However, we have found that we can usually solve the problem over the phone. So call first for a return authorization number because we can't accept any returns without it.

Immediate delivery

We have four types of delivery: *Next Flight Out*™ if you need it immediately; *Next Day Express*™ and *Day After Tomorrow*™ if you can wait a day or two; and our normal delivery—which we pay—if you can wait a few days.



Call Toll Free 1-800-341-7549 Ext. 300
In Illinois call (312) 882-7733 Ext. 300

Express Systems, Inc., 1254 Remington Rd., Schaumburg, IL 60196

Express Systems Product Line

Half-high tape drive, controller, and software

\$995

Tape Subsystem
Tape system, controller, power supply, cable, and chassis

\$1195

Internal Tape & H.D. System

Tape & hard disk internal systems complete with tape controller and hard disk controller software and cables. Hard disks are formatted and tested with DOS 3.0.

Tape drive & 10 MB H.D. \$1695

Tape drive & 21 MB H.D. \$1895

Tape drive & 31 MB H.D. \$2195

Hard disks kits

(includes controller and cable)

10 megabyte hard disk \$695

21 megabyte hard disk \$995

31 megabyte hard disk \$1395

*Subtract \$95 for IBM XT which does not require hard disk controller

Controllers

Hard disk controller \$195

Floppy Disk Drive \$129

Power Supply

130 Watt AT replacement Power Supply \$99.50

(Price valid only with purchase of tape drive or hard disk. Otherwise, \$149.95)

Tape Cartridges

Express Certified 555" \$35.00

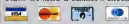
635 feet of specially tested 100 lbs tape

Express Certified 600" \$35.00

680 feet of specially tested 510 lbs tape

How to order

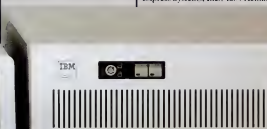
Pick up the telephone and call 1-800-341-7549, to order. We accept Master Card, VISA, American Express and Diners Club. Or send a cashier's check



or money order (We'll take a check, but you'll have to wait for it to clear) and tell us if you want one of our recommended configurations or you want to mix and match yourself. Corporations with a DUNS number may send purchase orders for quantities over five.



Our 130 watt power will convert your PC to XT standards; and it's only \$99.50 with any tape drive or hard disk order.



EDITOR'S SCREEN

topics will include integrated software, compatibility, training, corporate experience with the PC AT, and a look at 1986 and beyond.

Since the number of participants will necessarily be limited, we'll publish articles in *PC* based on transcripts from the sessions. That way, you can share the

thoughts and problems of some of the Western world's technology leaders.

Interactive Magazine

We think that this venture is a near-ideal blend of traditional publishing with Information Age technology. We hope you will, too. The key is that we are applying traditional editorial values and techniques to the output from the teleconferences.

Will our editing abridge the information that you get? We don't think so. Even if another company's problems are the same as yours, a raw transcript of its solution is not necessarily useful. At *PC* we strive to tell you what it means rather than just what is. We'll also be using the teleconferences as springboards for other, related articles. Your comments may suggest other teleconferencing topics that will, in turn, become new articles. Presto, interactive magazine.

We expect more interaction with you through the bulletin board system too. Your opinions about articles will come to us faster. Those of you who can't bear to take the fanfold paper out of your printers long enough to send us a letter won't have to. You can just upload your thoughts, reactions, bug fixes, and so on. There may be money in it for you, too. Remember: we pay for any User-to-User submissions that we publish, and those submitted electronically are eligible for a \$25 bonus.

We may not have even thought of all the uses for our interactive system yet. We plan to continue publishing indexes to *PC*, but what would you think of an on-line system to help you find articles?

Have you heard of an interesting-sounding product that we haven't yet covered? Let us know about it via the bulletin board, and we'll put it in the hopper. We'd like your suggestions.

We've looked at some of the assumptions that underlie this magazine and found them to be sound. They can always be improved though, and you, the interactive reader, can help. ■

A NEW KIND OF COMPUTER STORE

★ WE DISCOUNT EVERYTHING ★



1200 BAUD449.95
★ 1200 B INTERNAL389.95
★ INCL. FREE SMARTCOM II SOFTWARE ★



WORDSTAR235.95
WORDSTAR
PROFESSIONAL299.95

PROMODEM 1200309.95
VOLKSWRITER DELUXE ...179.95
AMDEK 310A189.95
FONTRIX79.95
FONTPAKS 1 THRU 9 EA.16.95

SIDEWAYS 44.95

MICROSOFT.
MULTIPLAN129.95
WORD WITH MOUSE299.95
(ALSO INCL. SPELLING CHECK)

COPY II
PC (BACK-UP LOTUS, SYMPHONY,
dBASE AND LOTS MORE29.95

KOALA PAD99.95
PFS: FILE, WRITE, REPORT,
GRAPH, PLAN EA.84.95

dBASE II289.95
III389.95

★ ★ CALL FOR OTHER PRICES ★ ★
★ BECAUSE HARDWARE AND SOFTWARE
PRICES ARE CHANGING SO RAPIDLY,
WE URGE YOU TO CALL US FOR OUR
VERY LOWEST CURRENT PRICES!
WE APPRECIATE YOUR BUSINESS and will do
everything we can to make you happy.
TERMS: F.O.B. Westminster, CA. We accept VISA,
Mastercard, Cash, Money Orders, Checks, Certified
Checks are better. Purchase Orders (2% 10-Net 15).
Add 2% for bank cards & P.O.'s. Ask about our return
policy. Prices are subject to change and happily
will go down.
Subject to stock on hand 3/95

Lotus 123294.95
★ ★ ★ SYMPHONY409.95

OKIDATA ★ INCL. FREE PLUG &
PLAY W/IBM CABLE
PURCHASE29.95 ★
★ OKI 92P369.95
★ 93P589.95

SILVER REED PRINTERS ★ ★ ★
EXP 400P 12 CPS 80 COL 299.95
EXP550 P19 CPS132 COL 419.95

Rana 10 MEG 1/2 HGT. 729.95



AST 6 PAK + 64K249.95
64K RAM (9) SET29.95

FRAMEWORK ...369.95
MANAGING YOUR \$129.95
DOLLARS & SENSE
W/FORECAST109.95
EPSON FX80 F/T +399.95
GEMINI 10X PC259.95

NEC ★ 2050769.95
★ 35501369.95
★ NEW ★8850 55 CPS 1869.95
★ INCL. RIBBON & THIMBLE ★
SIDE KICK39.95
TURBO PASCAL39.95

GARDEN OF EDEN COMPUTERS

ORDERS ONLY
800-762-3227
OUTSIDE CALIFORNIA ONLY
714-841-4994
INSIDE CALIFORNIA
16485 Magnolia, Westminster, CA 92683
1/2 blk. N. of the 405 Freeway
Mon-Fri. 10-6:30 Sat 10-5
CLOSED SUNDAYS & TUESDAYS

Total Telecommunications™

4 Products in One Package

Modem



- 300 baud auto dial-auto answer modem

ASCII PRO-EZ. Software



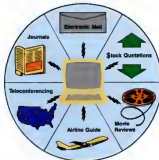
- Advanced telecommunications software
- Sends, receives and stores information
- Easy-to-use
- Automates connections and log-on sequences

Electronic Library



- 8,000,000 books in print
- Full encyclopedia
- Harvard Business Review
- Interactive lectures and seminars
- Microcomputer software directory

THE INFO CENTER™



- Electronic Mail
- Official Airline Guide
- Catalog Shopping
- Movie Reviews
- UPI world news and sports
- Stock quotations
- Journals and magazines in all career arenas
- Teleconferencing
- And much more!

Available at a computer store near you. Or call for more information:

800-22LEARN or 800-44LEARN in California

For Apple® II, II+, IIc, IIfx, IBM-PC® and PCjr™

Total Telecommunications and The Info Center are trademarks of TeleLearning Systems, Inc. ASCII PRO-EZ is a trademark of United Software Industries, Inc. Apple and IBM are registered trademarks of Apple Computer Inc. and International Business Machines, respectively.

TOTAL TELECOMMUNICATIONS

TeleLearning Systems, Inc.

505 Beach Street

San Francisco, California 94133

415/926-2800

TOGETHER,
STOPPING
YOU.



THERE'S NO

KnowledgeMan™ and You. The possibilities are endless.

To succeed in business, you need a partner that's fast, flexible, intelligent and easy to work with. A partner that can help turn your big ideas into well-conceived reality. One that gives you the support you need to make critical decisions confidently.

No partner can give you more of what you need than KnowledgeMan, the knowledge management software from MDBS.

A powerful partner.

KnowledgeMan helps you manage more knowledge, in more ways, than ordinary software. It can help you make better decisions on just about everything from production scheduling to financial planning to market



forecasting. KnowledgeMan and its optional components offer data management, spreadsheet analysis, statistical analysis, text processing, forms management, business graphics, programming and more.

The key to KnowledgeMan's versatility is its exclusive synergistic integration, allowing you to accomplish your computing needs within one program. Unlike other software, there's no need to exit one function before entering another. The result: different kinds of processing can be intermingled. Quickly and easily.

A partner that speaks your language.

For all of its power and sophistication, KnowledgeMan is remarkably simple to understand. Even a beginner can start putting KnowledgeMan to work in minutes. With a single query, you can obtain related data from unlimited multiple tables. You can even teach KnowledgeMan to understand your own jargon.

A partner that helps you along.

The on-line HELP facility allows you to draw on 6800 lines of helpful information organized into 380 screens. If you have a problem or question, KnowledgeMan allows you to access the pertinent HELP screen immediately. Each screen is carefully designed to provide a quick reference guide to KnowledgeMan commands.

A partner that gives you room to grow.

Ordinary software packages can be frustratingly easy to outgrow. Not KnowledgeMan. Each KnowledgeMan component has more power than you'll probably ever need—far more than conventional integrated programs. With KnowledgeMan, you don't sacrifice capability, capacity or convenience. So with KnowledgeMan, you spend your time solving problems—not trying to overcome software limitations.

A partner that protects your interests.

KnowledgeMan offers sophisticated security features. Unauthorized access to data is next to impossible, thanks to password checking, thousands of access code combinations and data encryption.

So your secrets are safe with KnowledgeMan.

A partner you can build on.

To add yet another dimension to KnowledgeMan's capabilities, you can get fully-integrated options like K-Graph, an extensive business graphics facility that



lets you plot information in a variety of colorful graphs, charts and diagrams. For text processing, the K-Text option lets you incorporate data into written documents quickly and easily. Or, create highly-polished, full-color customized forms with K-Paint, our forms painting option. To short-cut the keyboard, put the K-Mouse option to work.

A partner you should get to know better.

To see KnowledgeMan in action, visit your dealer. Or contact Micro Data Base Systems, Inc., P.O. Box 248, Lafayette, IN 47902, (317) 463-2581, Telex: 209147 ISE UR.

It may be the beginning of a long, successful partnership.

Current version is 1.07 as of 9/10/84. KnowledgeMan, K-Graph, K-Paint, K-Text, and K-Mouse are trademarks of Micro Data Base Systems, Inc. MDBS is a registered trademark of Micro Data Base Systems, Inc.

KNOWLEDGE man

The Knowledge Management Software
from MDBS



Applied Computer Products, Inc.

SPECIALS

CONTROL DATA

Full Size 320K DS/DD \$ 179*

*"The drive IBM trusted with its logo"

TEAC

Half-Height 320K DS/DD... \$ 149

"The #1 Rated Half-Height Drive"

64K RAM Chips

200ns Pre-Tested Best Price

AST SIXPACK w/384K Best Price

MAYNARD ELECTRONICS

10MB Hard Internal Hard Disk... \$ 899

with Tape Backup \$1,748

30 MB Internal Hard Disk \$2177

These Hard Disks can be easily installed in your PC in no time at all.

MULTIMATE w/80K Word

Speller \$ 269

EASYWRITER II/PELLER/MAILER

..... \$ 195

HARDWARE

COMPUTER SYSTEMS

IBM

PC w/256K 2-360K Floppy Drives... \$ Call

PC w/256K 1-360K Floppy, 1-10MB Hard Disk... \$ Call

AT w/256K 1-1.2MB Floppy Drive

AT w/512K 1-1.2MB Floppy, 1-20MB Hard Disk... \$ Call

PC/XT w/128K 1-360K Floppy, 1 10MB Hard Disk... \$ Call

COMPAQ

w/256K 2-360K Floppy Drives... \$ Call

w/256K 1-360K, Floppy, 1-10MB Hard Disk

All computer systems are configured to fit your individual needs. Each system is fully assembled and tested to ensure that all parts are in working order.

COMMUNICATION PRODUCTS

HAYES

Smartmodem 300 \$ 209

Smartmodem 1200 \$ 489

Smartmodem 1200B w/Smartcom II... \$ 419

TAC

Irma (Emulates 3278 Terminal) \$ Call

Irma Line (For Remote Emulation) \$ Call

We carry a wide variety of Mainframe Communication and Local Area Networks. For advice about which will suit your needs best give us a call and let us review them with you.

FLOPPY & HARD DISK DRIVES

ALLOY (Ideal for networks)

20-170MB Hard Disks w/Tape Backup... \$ Call

CONTROL DATA

Full Size 320K DS/DD \$ 179

Half-Height 320K DS/DD w/Bracket... \$ 159

I-OMEGA (Bernoulli Box) (10-20MB) Removable Hard Disks... \$ Call

MAYNARD ELECTRONICS

10MB Hard Disk WS-1 (XT Lookalike)... \$ 899

10MB Hard Disk WS-2 (XT Lookalike)... \$1049

SYSGEN

Image Backup (For XT or Maynard)... \$ Call

TALLGRASS

20-70 MB Hard Disk w/Tape Backup... \$ Call

TANDON

TM100-2 360K DS/DD \$ 170

TEAC

Half-Height 320K DS/DD w/Bracket... \$ 149

Half-Height 640K DS/DD w/Bracket... \$ 199

DISKETTES

MAXELL

MD2HD DS/Quad Density for AT... \$ 45

SCOTCH 3M

DS/DD Box of 10 \$ 29

VERBATIM

DS/DD Box of 10 \$ 29

DISK CONTROLLERS

MAYNARD ELECTRONICS

Standard Disk Controller \$ 115

with Parallel Port \$ 165

with Serial Port \$ 175

Sandstar Modular Disk Controller... \$ 199

All Sandstar Modular Options Avail... \$ Call

EXPANSION BOARDS

MAYNARD ELECTRONICS

Modular Memory Bnd. w/64K to 576K... \$ 209

Modular Multifunction Board \$ 95

AST RESEARCH

(All AST boards include SuperDrive, SuperSpool and 1 year warranty)

SixPack Plus w/64K to 384K \$ 259

MegaPlus II w/64K to 512K \$ 269

Memory Board II w/64K to 384K... \$ 239

IO Plus II \$ 139

MegaPack w/128K or w/256K... \$ Call

Parallel, Serial, Game Options... \$ 35

ORCHID TECHNOLOGY

Blossom w/64K to 384K \$ 249

TECMAR

Captain w/64K to 384K w/Software... \$ 269

QUADRAM

Quadboard w/64K to 384K... \$ 269

PRINTERS & PLOTTERS

EPSON

(All Printers include GRAPHTRAX-Plus)

RX-80 (120 cps, 80 cols) \$ Call

RX-80 F/T (120 cps, 80 cols) \$ Call

RX-100 F/T (100 cps, 132 cols) \$ Call

FX-80 F/T (160 cps, 80 cols) \$ Call

FX-100 F/T (160 cps, 132 cols) \$ Call

JH-80 8 Color Printer (160 cps, 80 cols) \$ Call

LO-1500 Near Letter Quality (200 cps, 132 cols) \$ Call

Epson-IBM Cable \$ 25

HEWLETT PACKARD

HP-7470A Two Pen Plotter \$ Call

HP-7475 Six Pen Plotter \$ Call

LaserJet Prints 8 pages/min \$ Call

ThinkJet Ink jet printer (80 cols) \$ Call

HP-IBM Cable (works w/Lotus 1-2-3)... \$ 50

NEC

NEC 3550 Letter Quality 35 cps... \$1499

NEC 2050 Letter Quality 18 cps... \$ 750

NEC 8850 55 cps \$1999

Bi-Directional Tractor \$ 235

Cut Sheet Feeder (Feeds 200 Sheets)... \$ 299

NEC-IBM Cable \$ 30

OKIDATA

Microline 83A (120 cps, 132 cols)... Best Price

Microline 92 (160 cps, 80 cols)... Best Price

Microline 93 (160 cps, 132 cols)... Best Price

Microline 84 (200 cps, 132 cols)... Best Price

Plug n' Play Best Price

Dikidata-IBM Cable \$ 25

We carry paper, acoustical enclosures, printer buffers and switches. Call for specifications and prices.

• Systems • Service • Support at Competitive prices

MONITORS

AMOEK	
Video 300A Amber Screen	\$ Call
Video 310A IBM Monochrome in Amber	\$ 170
PRINCETON GRAPHICS	
Newest models HX-12E and SR-12P (Call for info and price)	
HX-12 RGB Hi Resolution Color	\$ 499
Max-12 IBM Monochrome in Amber	\$ Call
SR-12 Hi Resolution Color	\$ Call
TAXAM 122 TTL in Amber	\$ 159
ZENITH 124 TTL in Amber	\$ 159

VIDEO—MONITOR BOARDS

HERCULES	Graphics Card	\$ 349
	Color Card	\$ 179
PARADOX SYSTEMS	Multidisplay	\$ 339
	Modular Graphics	\$ 320
STB	Graphic Plus	\$ 359
QUADRAM	Quadcolor I	\$ 189
TECHMAR	Graphics Master	\$ 479

Call for specifications and help in deciding which board fits your needs.

MISCELLANEOUS

RAM chips 64K Set	\$ Best Price
8087 or 80287 Co-processor	\$ Best Price
KEYTRONIC Deluxe Keyboard (KB 5151)	\$ Call
MOUSE SYSTEMS—PC Mouse	\$ Call
Surge Suppressors	\$ Call
Joysticks	\$ Call

SOFTWARE

ALPHA	
Database Manager II	\$ Best Price
Electric Desk	\$ Best Price
ASHTON TATE	
dBase II	\$ 285
dBase III	\$ Call
Framework	\$ Call
ATI	
All Software Training Pkgs	\$ Call
BORLAND INT'L	
Turbo Pascal	\$ 35
Sidekick	\$ 35
CENTRAL POINT SOFTWARE	
Copy II PC	\$ 35
FOX & GELLER	
Quickcode II or III	\$ 169
dGraph (Requires Graphics Card)	\$ Call
dUtil (Utilities for dBase II or III)	\$ Call
Quickreport (Report Generator, dBase II or III)	\$ 169

FUNK—Sideways	\$ 39
HAYES—Smartcom II	\$ 99
IMSI—4 Point Graphics (Rated #1) (Inhouse Lotus Graphics)	\$ 59
INDIVIDUAL SOFTWARE	
Tutorial Set (IBM PC/XT and DOS)	\$ 69
Typing Instructor	\$ 39
SORCIMIUS	
EasyWriter II System (See Specials)	\$ 195
Accounts Receivable	\$ 299
Accounts Payable	\$ 299
General Ledger	\$ 299
Order Entry	\$ 299
Inventory Control	\$ 299
Payroll	\$ 369
Supercalc III (Version 2)	\$ 199
INFOCOM—Zork I, II, III	\$ 29
All games available	\$ Call
LATTICE	
C-Compiler	\$ 299
C—Food Smorgasboard (C—Library)	\$ 110
Lattice Windows (Allows Windowing)	\$ 225
Float 87 (8087 support)	\$ 89
Panel (Screen Data Entry Aid)	\$ 189
Halo (Color Graphics Utilities)	\$ 125
LIFETREE	
Volkswriter Deluxe w/TextMerge	\$ 169
LOTUS DEVELOPMENT	
Lotus 1-2-3 (Version 1A)	\$ Call
Symphony	\$ Call
MICRO DATA BASE SYSTEMS	
Knowledgebase	\$ Best Price
Kgraph	\$ Best Price
Kpaint	\$ Best Price
Ktext	\$ Best Price
MICROSOFT	
C-Compiler	\$ 349
Flight Simulator	\$ 32
Multiplan (New Version)	\$ 129
Word	\$ 239

Our Policy

• We accept VISA, Mastercard, Money Orders, Certified Checks, Cashiers Checks, Personal Checks, Wire Funds • We do not charge your card until we ship • No surcharge added on VISA and Mastercard • Allow one week for personal and company checks to clear • COD maximum \$500 Cash or Certified check on delivery • Please use local phone number for order status inquiries • Prices subject to change without notice • Returns may be subject to restocking fee.

SHIPPING (U.S.). For monitors, printers, and hard disk drives add 2% to all orders. Blue label and Next Day Air available. For all other items add \$4. Most orders shipped next day.



APPLIED COMPUTER PRODUCTS INC.

1633 Republic Road, Huntingdon Valley, PA 19006
215-322-6500 Telex 756876 UD

1-800-223-3860

When you need competitive prices, prompt service and complete support, call us.

*IBM is a registered trademark of International Business Machines.
CIRCLE 129 ON READER SERVICE CARD

To Corporate Buyers:

Our Company has been selling IBM Microcomputer equipment and software almost as long as IBM. We have a technical support staff available 60 hrs/week to help you review product compatibility as well as solve any equipment or software problem you may encounter.

We offer Volume discounts and terms. Our consultants are waiting to serve you. So, Call Now!

Word w/Mouse	\$ 299
Mouse w/Software	\$ 139
Project	\$ 159
Chart	\$ 159
MICROPRO	
Wordstar w/Tutorial on Disk	\$ 195
Wordstar 2000 Newest Version	\$ 269
Professional Plus	\$ 329
Wordstar 2000 Plus	\$ 329
Propack	\$ 295
MICROIM	
R-base 4000	\$ 279
Clout	\$ Call
Extended Report Writer	\$ Call
MICROSTUF	
Crosstalk XVI (for Hayes Smartmodem)	\$ 99
MORGAN COMPUTING	
Trace 86 (Assembly Language Debug)	\$ 89
Ted (Program Editor)	\$ 69
Professional Basic (640K of workspace)	\$ 69
8087 & 80287 Support	\$ 39
MULTIMATE INTERNATIONAL	
Multimate (See Specials)	\$ 269
PETER NORTON	
Norton Utilities (Newest Version)	\$ 65
ROSESOFT	
Prokey (Newest Version)	\$ 95
SCARBOROUGH SYSTEM	
Master Type	\$ 29
SOFTWARE PRODUCTS	
Open Access	\$ Call
SATELLITE SOFTWARE INTERNATIONAL	
Word Perfect (includes Speller)	\$ 250
SOFTWARE PUBLISHING	
PFS/Access	\$ 65
PFS/File	\$ 89
PFS/Graph	\$ 89
PFS/Report	\$ 79
PFS/Write	\$ 79

We've got the system & software

HARDWARE

AST RESEARCH
AST 8-PACK PLUS multi-function board 64K/384K
8-Pack Plus 64K 259.95
For game port option add 34.95

CURTIS
SURGE PROTECTORS
Diamond 39.95
Ruby 69.95
Emerald 49.95
Sapphire 59.95

DCA INC.
Imma Board 3276 Emulation 899.95

KEYTRONICS
New! KB-S151 keyboard 174.95
KB-S151 159.95

KENSINGTON
MasterPiece 109.95

KOALA
Koala Pad 95.95
Game Port Card 39.95

MICROSOFT
Mouse with software 129.95

MOUSE SYSTEMS
Pc Mouse with PC Paint 159.95

QUADRAM QUADBOARD
New! Expanded Quadboard
64K 249.95 384K 439.95

SAFT
UPS Power Supplies
SPS-200 (200VA 1.7A) 439.95
SPS-400 (400VA 3.3A) 549.95

TALGTREE SYSTEMS
J RAM-22 memory board OK expandable to 2MB. Complete with Jet Drive and J spool software 129.95

TECMAR
CAPTAIN-64K 259.95

64K Memory Upgrade Set 34.95

DISK DRIVES

CDC DS/DD disk drive 199.95
TANDON TM 100-2 DS/DD
disk drive 129.95
TEAC 55B Half Height DS/DD
disk drive 129.95

HARD DISK DRIVES FOR IBM PC

ALBO
Cartridge back-up system for PC/XT & compatibles. 16.5 MB per single card. interface card incl. 1749.00

DATAMAC TRUSTOR
10 MB external hard drive system w/controllor card for PC 899.95
FIXT Autoboot ROM ITRUSTOR 64.95

OMEGA BERNOULLI BOX
10 MB bernoulli box 2295.00
20 MB (2-10 MB in cabinet). 2695.00
FIXT Autoboot ROM IBoxbox 94.95

TALLGRASS
Hard drive sub system with backup. TG-3020 35 MB w/backup 2495.00
TG-3025 35 MB w/backup 3995.00
Controllor for PC (req.) 124.95

DISPLAY CARDS

AST Monograph Plus paralleliser and clock calendar. Lotus 1-2-3 graphics compatible 399.95

HERCULES Color Card 179.95
Graphics Card (Mono) 329.95

MICRO MAX
COLORMAX Color/Monochrome Card (parallel port) 269.95

PARADISE
Modular Graphics Card 274.95
Parallel port for above 79.95

MODEMS

ANCHOR AUTOMATION
Express 300/1200 RS-232 279.95

HAYES
Smartmodem 300 199.95
Smartmodem 1200 RS-232 459.95
Smartmodem 1200B Internal with Smartmodem II 389.95

VENT-TEL
PC 1/2 Card Modem (internal) w/Crossstalk XVI 399.95
1200 Plus-External 300/1200 379.95

MONITORS

PRINCETON
HX-12 Hi-Res RGB Color 469.95
MAX-12 Amber TTL 164.95

QUADRAM
Amberchrome 12" Amber TTL 159.95

TAXAN
440-RGB 594.95
80B board for 440 449.95
420-RGB color 419.95
425-RGB color 429.95
122-12" TTL - Amber for PC 139.95
121-12" TTL - Green for PC 149.95
TATUNG 13" RGB 429.00

FLOPPY DISKS

	SS/DD	DS/DD
IBM 5 1/4" (10 MB)	29.95	
MAXELL 5 1/4" (10 MB)	16.95	27.95
FUJII 5 1/4" (10 MB)	17.95	24.95
NASHUA 5 1/4" (10 MB)	15.95	17.95
KODAK 5 1/4" (10 MB)	21.95	29.95

PRINTERS

BROTHER
HR-15 17 CPS 369.00
HR-25 23 CPS 649.00
HR-35 36 CPS 899.00
Tractor Feed HR-15, HR-25, 124.95
Sheet Feeder HR-15/25 199.95

DIABLO
830 API V-155 1099.95
Tractor Feed 289.00
Parallel Cable for 630 to PC 45.00
Single Sheet Feeder for 630 479.95

EPSON
RX-100 399.95 RX-80 F/T 289.95
RX-80 379.95 FX-100 599.95
RX-80 239.95 JX-80 Color 599.95

JUKI
6100 16 CPS Letter Quality 399.95
6300 40 CPS 779.95

NEC
8650 letter quality 1795.00
3550 letter quality 30 CPS 1379.00
2050 letter quality 18 CPS 599.95
Tractor Feed 3550/2050 209.95

OKIDATA
OKI-92 379.95 OKI-93 629.95
OKI-84 349.95 OKI 2410 1995.00

OLYMPIA
Compact RVO paralleliser letter quality 369.95

PANASONIC
KXP-1090 80 CPS F/T 209.95
KXP-1091 120 CPS F/T 299.95

QUME
SPRINT II55 plus 55 CPS with interface 1599.00
(Specify IBM PC parallel or standard Centronics parallel).

SILVER REED
EXP-550 19 CPS 439.95
EXP-770 36 CPS 799.00
Tractor Feed for EXP-550 134.95

TEXAS INSTRUMENTS
855 with Tractor Feed 799.95

TOSHIBA
P1351 Printer 1279.00
P1340 Printer 799.95

IBM-PC HARD DRIVE SYSTEMS

- IBM-PC 256K
- 20MB internal drive
- 360K DS/DD disk drive
- 2.7MB disk drive
- 140 watt internal power supply

\$3695.00

- IBM-PC 256K
- 10MB internal hard drive
- 360K disk drive
- 1.2MB disk drive

\$2895.00

- IBM-PC 256K
- 10MB internal hard drive
- 360K disk drive
- 1.2MB disk drive
- 140 watt power supply

\$2595.00

- IBM-PC 256K • 20MB internal hard drive
- 2-1/2-height 360K disk drives • 45MB internal cartridge backup system • 140 watt power supply.

\$4695.00



SOFTWARE

ALPHA
Electric Desk 199.95
Data Base Manager II 169.95

APPLIED SOFTWARE TECH
Versaform XL 79.95

ASHTON TATE
D base II 269.95
Ashton Tate D BASE III 349.95
Ashton Tate Framework 349.95

BILL BRIGHT ROBERTS
Graphics Partner 64.95

BORLAND
Turbo Pascal 31.95
Side Kick (protected) 31.95
Side Kick (non-protected) 54.95

BREAKTHROUGH
Time Line 264.95

BRODERBUND
Bank Street Writer 54.95

DOW JONES
Investment Evaluator 99.95
Market Analyzer (req. color card) 229.95
Market Manager plus 154.95
Market Microscope 239.95
Spread Sheet Link 164.95

DAYFLO
Dayflo 1.1 (XT/256K) 339.95

ENERTRONICS
Energraphics (req. color card) 229.50

FOX & GELLER for D Base
Quick Code 139.95
Duffil 44.50
D Graph 149.95
* For D Base II or III. Please specify OZ (req. 256K or color card) 209.95
R Graph for R Base 4000 149.95

FUNK SOFTWARE
Sideways 44.95

HARVARD SOFTWARE
Harvard Project Manager 209.95
New! Total Project Manager 269.95

HAYES
"PLEASE" Data Base 224.95

HERITAGE SOFTWARE
Smartkey II 49.95

HOWARD SOFTWARE
Howard Tax Preparer 1985 179.95

HUMAN EDGE
The Management Edge (128K) 165.00
The Sales Edge (128K) 165.00

IMSI
PC Paintbrush requires mouse & color card 79.95

INNOVATIVE SOFTWARE
Smart Software System
Includes: Spreadsheet, Word processor & Data Manager 599.95

IUS
Accounts Payable 309.95
Accounts Receivable 309.95
General Ledger 309.95
Inventory 309.95
Order Entry 309.95

LIFE TREE
Volkswriter Deluxe 159.95

LIVING VIDEOTECH
Think Tank (req. 256K) 109.95

MECA
Managing Your Money 119.95
Running Program 54.95

MEDIA CYBERNETICS
Dr. Halo 69.95

MENLO PARK
In Search 269.95

MICRO DATA BASE SYSTEMS
Knowledge Man 1.7 259.95

MICRO PRO
Wordstar Pro Pack 249.95
Wordstar 2000 249.95

you need, at the price you want.

COMPAQ PORTABLE SYSTEMS



- 100% IBM compatible
- 256K
- Two DS/DD disk drives
- Built-in hi-res monochrome monitor with graphics
- Color monitor card
- Parallel printer card
- DOS

Call or write.

PORTABLE WITH 10MB HARD DRIVE

• 256K RAM • 10MB hard drive • One DS/DD disk drive • DOS 2.x

\$2995⁰⁰

COMPAQ DESK PRO, Call or write.

INTERNAL HARD DRIVES & TAPE BACK UP FOR IBM-PC

½-High internal Cartridge
tape back-up for IBM PC,
XT or AT

\$995⁰⁰

140W internal Power Supply
for PC required with
tape back-up

\$189⁹⁵

20MB ½ height internal hard drive with controller,
Auto boot, Low power (req. DOS 2.x)

\$1099⁰⁰

MICROMIM
R Base 4000 (requires 256K) 259.95
Extended Reportwriter 95.50
New! Clout 2.0 149.95

MICROSOFT
Chart 159.95
New! Flight Simulator 34.95
Multiplan 129.95
Word w/Mouse & Speller 289.95

MICROSTUF
Crosstalk XVI 99.95
Remota 119.95

MONOGRAM
Dollars and Sense New! 119.95

MULTIMATE
Multimate Version 3.3 249.95

NOUMENON
Inbuilt Integrated Software 69.95

OSPREY ACCOUNTING SYSTEM
Accounts Receivable 219.95
Accounts Payable 219.95
General Ledger 219.95
Inventory 219.95
Sales 219.95
Invoicing 219.95

PETER NORTON
Norton Utilities 3.0 59.95

POWER BASE SYSTEMS
Power Base 2.0 259.95

PRENTICE HALL
Execution (req. color card) 259.95

PROGRAMMER'S CORNER
Lattice-C Compiler 295.95

P-Fix 86 Plus Debugger 299.95

C-Font Smorgasbord 109.95

Morgan Prof. Basic 79.95

Lattice Windows 219.95

Trace 86 99.95

Panel for Lattice-C 219.95

Halo (Lattice-C IBM card board) 149.95

P-Mate Text Editor 159.95

P-Trieve 195.50

Pink-86 Overlay Linker 299.95

X-Trieve 169.95

Mark Williams C 395.00

THE GREEN LEAF FUNCTIONS
General Library 134.50
Async Comm. Library 124.95

QUATERDECK
Desq (XT 512K) 289.95

ROSESOFT
Prokey 3.0 84.95

SIMON & SCHUSTER
Typing Tutor III 34.95

J.K. Laser Tag Program 54.95

SOFTSTYLE
SET-FX + (Epson FX printers) 49.95

Printworks 49.95

SORCUM
Supercalc 3 release 2 194.50

SOFTWARE PUBLISHING
PFS FILE 89.95 PFS Graph 89.95

PFS Report 79.95 PFS Write 89.95

SSI
Word Perfect Vers. 4.0 249.95

STATE OF THE ART
The Bookkeeping System 359.95

General Ledger 409.95

Accounts Payable 409.95

Accounts Receivable 409.95

Inventory Control 409.95

Order Entry 409.95

Budget & Finance Report 379.95

Sales Invoicing (Req. Acc Rec) 379.95

SOFTWARE ARTS
TK Solver 259.95

THE SOFTWARE GROUP
Enable 299.95

THOUGHTWARE
Assessing Personal Management
Skills 239.95

Managing Time Effectively 299.95


Leading Effectively 299.95



Trigger 339.95

VM COMPUTING
Relay Communication 99.50

WARNER SOFTWARE
Desk Organizer 129.95

WESTERN UNION EASY LINK
Instant Mail Manager 59.95

● No surcharge for credit cards. 

● Prompt and efficient service.  

● Extensive inventory of PC products.

● Knowledgeable and experienced sales staff.

We stock an extensive inventory on;
IBM PC/XT/AT®, Apple®, AT&T®, Kaypro®,
Compaq®, Olivetti®, Canon® and Sanyo®.

Remember Our Name — It's all the Memory You Need.

47st. Computer
Computers and Business Equipment

A Division of 47st. Photo Inc.

67 W. 47th St. • 115 W. 45th St.

NYC CA LIC. # 800189/891800

NYC CA LIC. # 800191

39 Ann Street Near City Hall and World Trade Center

Mail Order Address: 36 East 19th Street
New York, N.Y. 10003

212-260-4410

TOLL-FREE
OUT-OF-STATE **800-221-7774**

STORE HOURS:

Sunday 10-4, Monday-Thursday 9-6, Friday 9-2

We accept MC, Visa, American Express & personal checks (no delays if approved). Minimum shipping and handling 14.95. Software found to be defective will be replaced immediately. Defective hardware will be repaired or replaced at our discretion within the warranty period of manufacturer. Defective items must be sent to 36 East 19th Street, New York, N.Y. 10003, Attn: Service Dept. Prices herein are for mail & phone orders only. Store prices may differ. Some items are subject to availability. Due to manufacturers price fluctuations, the prices may change beyond our control. This ad supersedes all previous PC ads.

Keep in touch with the latest items on the market and our up-to-date sale prices by checking our weekly ads in the National editions of the N.Y. Times and Wall Street Journal.

IBM® is a registered trademark of International Business Machines Corp.
PC Magazine March 18, April 2, 1985/PC World - April 1985. Submitted Jan 18, 1985

THE 8087 AND 80287 ARE IN STOCK!

MicroWay is the world's leading retailer of 8087's and high performance PC upgrades. We stock a complete selection of 8087's that run at 5 and 8mhz. All of our coprocessors are shipped with a diagnostic disk and the best warranty in the business - 180 days! We also offer daughterboards for socketless computers such as the NEC PC and PCjr, and a board which increases the clock speed of the 80287 in the PC AT. Our new NUMBER SMASHER™ will run the IBM PC at clock speeds up to 9.5mhz and achieves a throughput of 1 megaflops with 87BASIC/INLINE.

Intel Fortran, or Microsoft Fortran. Software reviewers consistently cite MicroWay software as the best in the industry! Our customers frequently write to thank us for recommending the correct software and hardware to meet their specific needs. They also thank us for our same day shipping! In addition to our own products which support the 8087 and 80287, we stock the largest supply of specialized software available anywhere. These include three FORTRANs, three PASCALs, APL, Intel's ASM-86 and PL/M-86, several Cs, 87BASIC/INLINE,

87MACRO, 87FFT, and MATRXPAC. For real time or multi-user applications we offer RTOS™ - our implementation of Intel's iRMX executive. Our new products include a professional debugger with 8087 support, support for Lotus 1-2-3, and a translator that converts object modules into readable assembly language files. If you have a question about which computer, language, compiler, operating system or application package is best suited to your problem, we can answer it. Just call:

617-746-7341

MicroWay™ 8087 Support

For the IBM PC, PC XT, PC AT and Compatibles.

SCIENTIFIC SOFTWARE

87FFT™ performs Forward and Inverse FFTs on real and complex arrays which occupy up to 512K bytes of RAM. Also does convolutions, auto correlations, hamming, complex vector multiplication, and complex to radial conversions. Callable from MS Fortran or 87BASIC/INLINE. **\$150**

87FFT-2™ performs two-dimensional FFTs. Ideal for image processing. Requires 87FFT. **\$75**

MATRIXPAK™ manages a MEGABYTE! Written in assembly language, our routine package accurately manipulates large matrices at very fast speeds. Includes matrix inversion and the solution of simultaneous linear equations. Callable from MS Fortran 3.2, 87MACRO, 87BASIC/INLINE, and RTOS. **each \$150**

DATA ACQUISITION PACKAGE Allows the acquisition and analysis of large data streams. **CALL**

GRAPHICS PACKAGES

Engraphics (stand alone) **295**
Grafmatic for MS Fortran or Pascal **125**
Pictmatic for Grafmatic **125**
Halo for Basic, C or Fortran **each 150**

OTHER TOOLS

Alpha Software ESP **595**
Borland Sidekick, Toolbox, or Graphics **35**
COSMOS Revelation **850**
PSI MATHPAK **75**
SMARTWORK **995**
SPSS/PC **695**

DFixer

A disk utility which thoroughly checks PC or AT hard disks for bad sectors and updates the MS DOS file allocation table accordingly. **149**

MAINSTREAM

Maynard's portable streaming tape backup. 60 megabyte version **1995**
Cartridge **50**

1-2-3 and Lotus are trademarks of Lotus Development Corporation.

RTOS - REAL TIME OPERATING SYSTEM RTOS is a multi-user, multi-tasking real time operating system. It includes a configured version of Intel's iRMX-86, LINK-86, LOC-86, LIB-86, OH-86, and MicroWay's 87DEBUG. Runs on the IBM-PC, XT, PC-AT and COMPAQ. **400**

INTEL COMPILERS¹

FORTRAN-86 **750**
PASCAL-86 **750**
PL/M-86 **500**
87C (LATTICE/MICROWAY) **750**
ASM-86 **200**

87BASIC/INLINE™ converts the output of the IBM Basic Compiler into optimized 8087 inline code which executes up to seven times faster than 87BASIC. Supports separately compiled inline subroutines which are located in their own segments and can contain up to 84K bytes of code. This allows programs greater than 128K! Requires the IBM Basic Compiler and Macro Assembler. Includes 87BASIC **\$200**

87MACRO™ - our complete 8087 software development package. It contains a "Pascal processor" source code for a set of 8087 macros, and an object library of numeric functions including transcendental, trigonometric, hyperbolic, encoding, decoding and conversions. For the IBM Macro Assembler, Version 1.0 or 2.0. **\$150**

OBJ-ASM™ - a multipass object module translator and assembler. Produces assembly language listings which include public symbols, external symbols, and labels commented with cross references. Ideal for understanding and patching object modules and libraries for which source is not available. **\$200**

87DEBUG™ - a professional debugger with 8087 support, a sophisticated screen-oriented macro command processor, and trace features which include the ability to skip tracing through branches to calls and software and hardware interrupts. Breakpoints can be set in code or in guarded addresses in RAM. **\$150**

HARDWARE AND LANGUAGES

8087-3 5mhz \$149
Including DIAGNOSTICS and 180-day warranty
For IBM PC and compatibles.

8087-2 8mhz \$275
For Wang, AT3T, DeskPro, NEC, Leading Edge

80287-3 5mhz \$275
For the IBM PC AT

64K RAM Set \$22
256K RAM Set \$135

128K RAM Set PC AT \$185

NUMBER SMASHER™ 1590
9.5mhz 8087 coprocessor board for the IBM PC

LOTUS 1-2-3™ 8087 Support... CALL

FORTRAN AND UTILITIES

Microsoft Fortran 3.2 **229**
IBM Professional Fortran **585**
Intel Fortran-86 **750**

FORLIB **65**
STRINGS and THINGS **65**

C and UTILITIES

Lattice C **299**
Microsoft C **329**
C86 **299**

C TOOLS **85**
C Trigs and Trans **150**

BASIC AND UTILITIES

IBM Basic Compiler **270**
87BASIC/INLINE **200**
Summit BetterBASIC™ **175**
Summit 8087 Module **67**

MACRO ASSEMBLERS

IBM Assembler with Librarian **155**
87MACRO **150**
Microsoft Assembler V.3.0 **125**

PASCAL

Microsoft Pascal 3.2 **199**
Borland Turbo Pascal **35**
Turbo with 8087 Support **65**

APL

STSC APL+PL/US/PC **475**
Pocket APL **35**
¹Requires RTOS or iRMX-86. All Intel compiler names and iRMX-86 TM Intel Corp.

MicroWay

P.O. Box 79
Kingston, Mass.
02364 USA
(617) 746-7341

**You Can
Talk To Us!**

Letters to PC

The Beauty of Letters

I consider myself more of a "word person" than a programmer, so your comprehensive review of printers was thorough and timely for me (*PC*, Volume 3 Number 23). However, I felt that some issues concerning printers needed more attention.

I hope that you will focus more on proportionally spaced type in future issues. It took many years for artists and calligraphers to design the beautifully shaped letters of our alphabet in many styles. That heritage was abruptly dumped in the mid-nineteenth century to serve a revolutionary new machine called the typewriter. These characters are a grotesque deformation of lettering, which apparently has remained the standard 100 years later.

Now that machines are smart enough to handle lettering as it was meant to look, the sooner we abandon that abomination called typewriter quality the better. Please help bring that about by informing your readers of the facts on proportional spacing; you should report, for example, how many proportionally spaced fonts a printer offers and note software that can micro-justify proportionally spaced type.

M. David Stone states in his introductory article on fully formed character printers ("Fully Formed Print: The Wheel Thing") that typewriters acting as printers should be avoided. Your issue just missed the introduction of IBM's Selectric 2000 series, touted as typewriters that can be used as printers. If Selectric type is the standard, this series should be of interest, especially considering that it replaces type balls with daisywheels or thermal-impact technology. Frankly, I think that IBM achieved a breakthrough with the top-of-the-line QuietWriter.

A software/printer combination that can make copy look almost typeset is exactly what I'm looking for. Your reviews convinced me that it might be smart to wait until printers are a little more refined. Even the best printer still looks like a compromise to me.

I'll know that printer manufacturers have grasped their power to restore beauty to the written word when they make

A HARD LOOK AT HARD COPIES



one small but profound change—replacing the crude, double-duty vertical apostrophe on the proportionally spaced fonts with two traditional single quotation marks.

Dale F. Mead
Cupertino, California

You're right—proportionally spaced printing is really more of a software than a hardware issue. Many printers can handle proportionally spaced fonts, but word processors that support proportional spacing for each printer are difficult to find.

Look for reviews of IBM's new line of printers in future issues of PC.—Ed.

A Mysterious Bubble

I found your issue devoted to printers very informative, but think I should point out an oversight in the reviews of the Facit dot matrix printers.

On page 188, Charles Petzold states that the Facit 4512 kept going into the off-line state whenever the PC was boot-

ed or anytime the printer received an initialization signal. In a separate review of the Facit 4511, Jim Forney makes the same observation.

I recently used a Facit 4511, and one of the first things that I noticed is that the printer seemed to go off-line whenever I turned my back. A quick reference to the "Controls and Indicators" section of the technical manual revealed that the printer has a solder bubble on its circuit board that controls whether the printer is on- or off-line. As it turns out, the printer also goes off-line when pin 31 of the Centronics interface is held low, which apparently happens during booting, and when you run BASIC or a compiled BASIC program.

The solder bubble was easily changed with the aid of a soldering iron, but I can't help wondering why Facit Data Products felt that the printer should constantly throw itself off-line. I feel that either the solder bubble should have been factory-set to stay on-line, or a simple jumper or switch should have been provided so that the average user could make the necessary change.

Jim Baumgartner
El Toro, California

A solder bubble? Sorry, we couldn't find it in Facit's documentation. We're glad you found it, and now other readers know about it too. Now those with soldering irons can make their Facit printers work.—Ed.

Alternate Commands

I really enjoyed your special issue on printers. The reviews helped confirm my decision to buy an Okidata Microliner 93 (the IBM Plug 'n' Play version). It looks like it will be versatile enough to meet all my needs.

(continued)

**d new improved
sort time.**



(time to sort 1,000 records)

R time.



(time to sort the same 1,000 records)

When the other leading DBMS company finally came up with a new improved version, some people thought the waiting was over.

How wrong they were.

Because even with this upgraded version, you still have to wait a minute and a half for a simple data sort.

At Microrim, however, we've always thought that was too long to wait. Fact is, our original R:base™ 4000 is still three times faster than the best they could do.

And that's only the beginning. With R:base 4000, you don't have to create a separate file every time you want to set up a data sort. Or go through three separate commands before you see an answer. Instead, you just use one command: SELECT. Which can save you a lot of time and disk space. While increasing your productivity far more than their new improved version ever will. And we can show you just how much. For only \$9.95 (plus shipping), we'll send you a demo package. Just call 1-800-547-4000, Dept. 502. In Oregon, or outside the U.S., call 1-503-684-3000, Dept. 502. Or visit your nearest software or computer store.

R:BASE™
FROM MICRORIM®

It's easy when you do it R way.

Now available for the IBM PC-AT™

CIRCLE 426 ON READER SERVICE CARD

To get a lot out of your printer, you need a lot of programs, right?

SoftStyle™

SoftStyle, Inc. 7192 Kalaanaloa Hwy Suite 205
Honolulu, Hawaii 96825 Phone (800) 367-5600
\$69.95 Enhances over 30 dot matrix printers, including
Epson and Okidata IBM PC or compatible

CIRCLE 94 ON READER SERVICE CARD

Wrong.
Sure, you could buy one package to change type sizes, another to create fonts, and still another to print sideways. Or you could get one simple program to do it all!

Printworks.™
It's loaded.



LETTERS TO PC

However, if the Microline 84 control codes are the same as the Microline 93's, then I found an error in your review (page 184). Whenever a three-element escape sequence ends with either 0 or 1 as the only possible values for the third character, the Microline 93 will accept an alternate form of the command. In this case only, the null character (ASCII 0) and the character 0 (ASCII 48) may be used interchangeably. Also, the ASCII 1 code and the character 1 (ASCII 49) will have the same effect. I have tried using both versions of a few of these codes, and they work either way. The explanation of this was a little hard to find; it was buried in the Microline 92/93 manual on page 61, but it is not repeated in the control-code table.

I'm glad that you print the Coming Up section. When I read that you were having a special issue on printers, I delayed my purchase of a printer until I had a chance to read the issue. In that time, Okidata lowered the price of the Microline 93 by \$100, and the price of the Microline 84 was lowered even more.

Keep up the good work. I find your comparisons of similar products (such as your series on databases, word processors, and printers) especially useful.

Bill Tinsley
Iowa City, Iowa

Thanks for your tips on the Microline command sequences—these codes are tricky, so every bit of advice helps.—Ed.

Available Fonts

I am the owner of a Toshiba P1351, so I appreciated your review in the printer issue (page 218). However, I am concerned about two points that were made: that the P1351 lacks double-strike or emphasized modes and that the fonts are defined for only 126 characters.

I find that the bold function key is very emphatic, because it is more than just double striking. Also, when printing out the font test file, I counted 145 actual

Business as Usual?

Business as usual these days means a computer that's up and "humming." But if your computer were stolen or damaged, you wouldn't have business as usual.

YOU'D HAVE TROUBLE!

You can get fast replacement for your entire system and be back in business in a hurry by protecting your computer with SAFEWARE Personal Computer Insurance. It's the only coverage designed specifically for personal computers used for business—in your office, shop or home.

SAFEWARE protects ALL hardware, ALL purchased software and ALL media against theft, accidental damage, natural disaster, power surge, etc., regardless of use, after a low \$50 deductible.

(Not without your computer it wouldn't be.)

Fast, courteous claims handling prevents your losing valuable business computing time.

Find the premium price for the coverage you need listed in the table below, available for as low as \$35 per year. Fill in the coupon today. Your coverage will begin as soon as your payment is accepted. Or, for even faster coverage, call our toll-free number.

1-800-848-3469

(In Ohio call 1-614-362-0539)

Phones open 8 a.m. to 8 p.m.

Monday through Saturday

SAFEWARE

Total Hardware, Media & Software System Value	Annual Premium
Up to \$ 2,000	\$ 35
\$ 2,001-\$ 5,000	\$ 60
\$ 5,001-\$ 8,000	\$ 75
\$ 8,001-\$11,000	\$ 90
\$11,001-\$14,000	\$105

Call toll-free for rates on higher coverage.
Coverage differs in Texas.
It is an underwriting requirement that you insure your system for its full value.
Call for student rates.

Mail to: SAFEWARE, P.O. Box 02211, Columbus, OH 43202

Before I'm out of business,
please issue my SAFEWARE Insurance Coverage.

Name _____

Street _____

City _____ State _____ Zip _____

System value \$ _____ ☐ Check Enclosed ☐ VISA ☐ MasterCard

Card # _____ Exp. Date _____

Signature _____

No risk. You may return contract for full refund within 90 days. Coverages and limits are subject to the terms, conditions and exclusions in the contract.

LETTERS TO PC

characters printed, without using any of the alternate or control keys for special characters.

I really appreciated your mention of the Toshiba diskette and the Fonts America and Greentree software. I initially had trouble locating a distributor, but I finally found a package that included all three diskettes. Thank you for your review; I am most pleased with my P1351.

Lorene Pouncey
Houston, Texas

The 1351 is entirely dependent on the software driving it for shadow boldfacing. If your word processor can tell the printer how to do it, it looks great. Toshiba is aware of the problem you had finding the software, so it now packages the printer with information on obtaining the font programs.—Ed.

Neglected Diskettes

All of the issues of *PC Magazine* have been excellent. Your reviews and comparative charts on various hardware, software, and accessory components are helpful.

But there is one item you've neglected—floppy diskettes. If there is any single item used by all computers users, it would surely be floppy diskettes. How about a comparative review of the different brands of floppies? How should we know which brand to buy? How about buying floppies through mail-order houses?

I hope you will cover this topic in a future issue.

Dorothy Wright
Detroit, Texas

Defective Error Detection

A reviewer who takes an author to task for carelessness should have his own facts straight. Luther Sperberg fails to do this in his book review "Computer Knowledge: New Perspectives" (*PC*, Volume 3 Number 20). In the review of *Personal Computers A-Z*, he writes, "But if you prefer, as I do, accuracy of



Do you spend 4 hours
or more each day at
your word processor?

NOW YOU CAN SAVE
45 MINUTES
EACH
DAY!

...Just By Switching To The
Fastest Word Processing
Software: **XyWrite II PLUS**.

XyWrite II PLUS is lightning-fast! Won't keep you waiting. Ideal for the serious word processing job or the professional writer. Thousands of satisfied XyWrite II PLUS users now enjoy the hours and days they save each month.

Time is money! The \$295 you invest in XyWrite II PLUS will be repaid in 3 months of time saved. Order now! XyWrite II PLUS requires the IBM PC, XT, AT, or compatible hardware, with 192K memory.

Order XyWrite II PLUS directly from us, the authors, or call



for a dealer near you. We wrote it, we support it after the sale. That's the best support you can get!



Call now:
John Hild or
David Erickson,
at (617) 275-4439.

XyQuest Inc.

P.O. Box 372 Bedford, MA 01730
(617) 275-4439

Rated #1 in the *Software Digest's*
overall
evaluation
rating.



In the
time it takes
to win your next
match... you can
finish off your 1984
tax return.

You'll have the advantage of
every conceivable tax cut.

With **PC/TaxCut** even the most grueling
tax returns are blissfully simple.

You don't have to be a tax or computer expert to save time and money on your next return. **PC/TaxCut** calculates and prints your 1040 long form and 21 other forms and schedules. Gives you professional, computer printed returns—the kind the IRS just loves to see.

Our guarantee.

If **PC/TaxCut** goofed we pay the penalty.

In the unlikely event that **PC/TaxCut** makes a mathematical miscalculation in your tax return and the IRS requires you to pay a penalty as a result, we'll pay it for you. Complete information on this conditional guarantee is available on request from: Best Programs

Tax break point: Call or write today

For immediate delivery of your **PC/TaxCut** program or for more information, phone us toll free at 1-800-368-2405. Or complete the coupon below and mail today.

**Yes, I want to be a winner
on April 15, 1985.**

- ☐ Send me more information about **PC/TaxCut**
- ☐ Send me **PC/TaxCut** for \$195,
plus \$4.50 postage and handling
(Virginia residents add 4% sales tax)
- ☐ Check enclosed
- ☐ Please charge my credit card:

☐ American Express ☐ Visa ☐ MasterCard

Card number: _____

Ex. Date: _____

Name: _____

Address: _____

City: _____

State: _____ Zip: _____

Phone: (_____) _____

BEST PROGRAMS™

"The Quality Software Company"

5134 Leesburg Pike Alexandria, Virginia 22302

Phone Toll-Free 1-800-368-2405

CIRCLE 131 ON READER SERVICE CARD



Se habla Español

Call for programs not listed

Technical & Other Information (602) 246-2222
TOLL-FREE ORDER LINE 1-(800) 421-3135

FREE! PRINTER SET SOFTWARE

Purchase an Okidata, Epson or Gemini printer and receive at no charge a menu driven program to set print characteristics or to make your computer function as a correcting typewriter. Retail value \$35. Available for most disk formats.

DATA BASE MANAGEMENT SYSTEMS

Fox and Geller Quickcode	\$145
KnowledgeMan	\$249
Condor III	\$295
NWA Statpak	\$265
Tim IV	\$245
DBase Manager II	\$165
FRIDAY	\$159
Personal Pearl	\$215
PFS File	\$79
Electric Desk	\$105
RBase 4000	\$255
CLOUT 2	\$129
Power Base	\$229

WORD PROCESSING

Wordstar Pro Pack	\$240
Samna III	\$310
Wordstar 2000 for IBM PC	\$245
Wordstar 2000 +	\$295
Leading Edge Word Processor/Merge	\$385
Microsoft Word With Mouse	\$284
Word Perfect	\$225
VolksWriter for the IBM PC	\$110
VolksWriter Deluxe	\$149
Random House Spell Checker	\$36
PFS Write	\$78
Multimate	\$259
Peachtree 5000	\$185

SPREADSHEETS

Supercalc II	\$145
Supercalc III	\$160
Microsoft Multiplan	\$119
ITK Solver	\$259
Lotus 123	\$294
Symphony	\$415

ACCOUNTING

TCS, Big Four equivalent of Peachtree Series 4 - Specially augmented and customized for your IBM PC Terminal and Printer - GL, AR, PA, AP, CP/M-80, CP/M-86 for PC XT, DOS 1.1, 2.0.	
Each Module ... \$65 For All Four \$249	

CYMA	Call
Dollars & Sense	\$95
MBSI Accounting (Real World)	Call
Tobias Managing Your Money	\$99

TRANSFER PROGRAMS

Hayes Smartcom	\$85
Move-It	\$79
Microsoft Crosstalk	\$95

BEST PRICE IN U.S. FOR IBM PC OR CLONES

Multifunction Board - Includes Async Adapter, Parallel Adapter, Clock with battery back-up and Software, 64K memory expandable to 384K, 1 year warranty. \$235

LANGUAGES

Lifeboat Lattice C Compiler	\$285
Microsoft C Compiler	\$299
Microsoft Pascal Compiler	\$185
Microsoft Basic Compiler	\$235
Microsoft Basic Language	\$225
CP/M-86 for IBM PC	\$37
Concurrent ODS	\$179

FOR PC DOS

PC Paint Brush	\$85
Norton Utilities	\$59
Copy II PC	\$24
Prokey V3.0	\$79
Harvard Project Manager	\$275
Microsoft Flight Simulator	\$32

HARDWARE

ABC Printer Switch	\$85
Micro Fazer Parallel 64K	\$185
Hayes 1200 Modem	\$450
Hayes 1200B Modem for IBM PC	\$379
64K RAM Chips (9) 150 NSEC	\$28
Anchor Signalman 1200 baud Modem	\$235
I Omega Bernoulli Box	
20 Megabyte	\$2050
Princeton RGB Monitor	\$458
Texan RGB Vision 425	\$398

COMPUTERS

IBM Computer	Call
Corona Computer	Call
Televideo Portable & Software	\$1795

BOARDS FOR THE IBM PC

OR LOOKALIKES

Hercules Color Board with Par. Port	\$169
AST Six Pack	\$245
384K Board with 256K	\$275
Quadcard I	\$185
STB Graphics II Board	\$335
Paradise Graphics Board	\$275
New Quadram Multifunction Board	Call

Diskette Super Special	
10 0/S 0/0 (Qty 100)	\$14.95

Gemini SG/10	Call
Gemini SG/15	Call
Okidata 82A, 83A, 93P	Call
Okidata 92P	\$369
Okidata 84P	\$575
Juki 6100	\$369
Juki 6300	\$699
Call on all Epson Models	
Silver-Reed EXP 400	\$230
Silver-Reed EXP 550	\$395
Toshiba 1351	\$1210
NEC, Diablo,	Call

LETTERS TO PC

information over accessibility, *Personal Computers A-Z* falls somewhat short. Here are some of the examples of the misinformation it peddles: ... a byte can be 4 or 16 bits (word length may vary, but a byte is always 8 bits)."

Unfortunately, regardless of other errors in the book, the "misinformation it peddles" was correct in this case. A byte is any string of bits dealt with as a unit.

The word *byte* was first used for the IBM 7030 and was developed as part of "Project STRETCH" well before the advent of the System/360. I have been told that the word was originally used for 16-bit bytes on SAGE. The term was picked up and used by other manufacturers, including DEC for its PDP-6 and PDP-10. The 7030 could directly address any byte from 1 to 64 bits, without concern for boundary alignment.

Although the assumed length of a byte for the IBM S/370 is 8, various IBM publications use byte lengths of 7 and 9 when dealing with magnetic tape. DEC routinely assumes the default length to be 7 on the PDP-10 (5 ASCII characters are stored per each 36-bit word, with 1 bit wasted). CDC routinely assumes a default byte size of 12 on the machines that have evolved from the 6600.

Seymour J. Metz
Annandale, Virginia

Corrections

The correct name of the writer of "Up in Smoke" is Bruce Gast, not Gest (PC, Volume 4 Number 1).

Because of a production error, the assembly language listing in "REDirecting Your Files" (Programming, Volume 4 Number 4, page 245) appeared incorrectly. A correct listing may be obtained from: Technical Editor, *PC Magazine*, One Park Ave., New York, N.Y. 10016.

In the article "Bisync Comes of Age" (Volume 4 Number 2, page 151) there should have been one AST Research product, not two; it's the AST-3780, and its price is \$895.

TERMS: Prices include 3% cash discount. Add 3% for charge orders. Shipping on most items \$5.00. AZ orders +6% Sales Tax. Personal check, allow ten (10) days to clear. Prices subject to change.

TOLL-FREE ORDER LINE 1-(800)-421-3135

WAREHOUSE DATA PRODUCTS

2701 West Glendale Ave., Suite 6
Phoenix, AZ 85021

FIRST CHOICE

PC, The Independent Guide To IBM Personal Computers



PC is the only magazine that keeps you up-to-date with the newest trends, innovations and releases in IBM and compatible personal computer technology. Every-other-week, you'll receive the most current news on how other users and professionals like yourself are using their IBM PC...you'll discover the newest hardware on the market and what it promises (and actually delivers) to you and your system...and you'll never be out-of-date with the newest software releases.

In short, when you subscribe to PC, you're subscribing to the first choice for IBM PC users who want to make the most out of their system.

If you use an IBM PC or compatible, you owe it to yourself to subscribe to PC, your source for new ideas, information, and innovations.

ACT TODAY AND GET UP TO 8 BONUS ISSUES!

FOR NEW IDEAS, INFORMATION & INNOVATIONS...

YES,

Check one:

- ☐ Payment enclosed
☐ Bill me later

For faster service,
phone toll-free,
1-800-852-5200



P.O. Box 2443, Boulder, Colorado 80322

Please enter my subscription to PC for:

- ☐ 24 bi-weekly issues for \$21.97 INCLUDES 4 BONUS ISSUES. SAVE 32%!
☐ 48 bi-weekly issues for \$39.97 INCLUDES 8 BONUS ISSUES. SAVE 38%!

Savings based on full one-year (26 issue) subscription price of \$34.97.

Mr/Mrs/Ms. _____ please print full name

Company _____ Title _____

Address _____ ☐ business ☐ home

City _____ State _____ Zip _____

Please add \$48 a year postage in Canada and all other foreign countries. Allow 30 to 60 days for delivery of first issue.



With Network Revelation[®], you're not alone.

Span the void that separates you from other PC's. Be as one with a universe of data. Be a true network with Network Revelation[®].

Network Revelation is more than a relational database management system. It's a complete applications environment for most microcomputer networks. That's not dreaming about the future. It's low-key raving about a capability of the present.

With Network Revelation, you can send and receive data on local area networks and remote file servers. Rev's data dictionaries let you add or restructure

fields at will, saving ages of programming time. And our menu-driven applications generator and procedural language are eons ahead of other databases.

The possibilities are infinite. Distributed processing systems linking worlds. Accounting, inventory and order entry systems connected for instant access to data by a galaxy of users. And your data is secure with complete file or record locking.

REVELATION co-exists with MS-DOS[™]. So you can transport Lotus 1-2-3[™], Multiplan[®] or other data from

PC to PC—using popular routes like Novell, Ethernet or 3 Com[™]. You can even evolve files from primitive, single-user databases into a powerful Rev application.

Encounter the future of distributed data processing today. Revelation costs just \$950.00*. Network Revelation starts at only \$1495.00* for a complete four-user system. So call us and we'll arrange for an unforgettable demonstration with a Cosmos rep in your area.

MS[™] and Multiplan[®] of Microsoft Corporation. 1-2-3[™] of Lotus Development Corporation. 3 Com[™] of 3 Com Corporation.

*Suggested U.S. list price.

Cosmos, Inc., 19530 Pacific Highway S.

COSMOS[™]

CIRCLE 218 ON READER SERVICE CARD

Seattle, WA 98188, 206-824-9942

Writing Programs for TopView

In contrast to many other windowing systems, TopView bends over backwards to accommodate every program. Here's how to fine tune your programs to work with TopView.

As different models of the IBM PC, more related computers from other manufacturers, and more software "environments" come on the market—including different versions of DOS and a multitude of windowing systems—the problems of writing programs that will run smoothly for all the various equipment combinations can get out of hand.

Unfortunately, there is no good solution to this predicament—just messy and unhappy trade-offs. As I've mentioned previously, the approach to sending information to the screen that works in the widest variety of computer environments is the ANSI device driver introduced along with DOS 2.0. ANSI's advantage is that it allows you to use software on machines that are not PC-compatible, like the nifty Wang PC. Otherwise, it's so slow that you wouldn't use it unless you had to.

A One-Shot Solution

For PC-compatibles and semicompatibles, such as the TI Professional, the best one-shot solution is to write a screen driver that uses the PC's built-in BIOS services to write screen information. Even though these services are peculiar to the PC, they also work on many computers that aren't 100 percent PC-compatible; many have PC-emulation pro-

grams that allow them to perform BIOS services that match the PC's.

For me, the best solution has been not to rely on a one-shot method but to provide my programs with three screen driv-



Peter Norton

ers to use under three circumstances—one fast performer that writes straight into the display memory, so it is tightly coupled to the PC's hardware, one that uses the BIOS method, and one that uses the ANSI driver.

Windowing Systems

How do you make your programs work on a wide variety of software environments, particularly windowing systems? Windowing systems are currently a hot topic, and IBM is mounting an ag-

gressive campaign to push its *TopView* windowing system, so I want to discuss how your programs can accommodate themselves to these systems and to *TopView* specifically.

Windowing systems—such as Microsoft's *MS-Windows*, Digital Research's *Concurrent PC-DOS*, Quarterdeck's *DESQ*, and IBM's *TopView*—supervise the operation of the computer and the use of the display screen, including keyboard, disk, and everything else. The various windowing systems differ greatly in how well they mesh with unruly programs and by how much they require programs to do things their way. At one extreme, *MS-Windows*, as originally designed, worked only with programs custom-written for it; at the other, *TopView* bends over backwards to accommodate every possible program.

The Tame Way

To have your programs work with any or all of these and other windowing systems, our clear choice of screen driver mechanisms is the PC BIOS services, the most widely acknowledged and also the tamest method of putting information onto a PC's display screen. These provide your best hope of finding one method that will work with many different windowing systems.

Next, I want to focus on a particular

NORTON CHRONICLES

windowing system, *TopView*, to see how to fine tune your programs when they run under it. *TopView* handles output that's generated either by a BIOS-type driver or

by a driver that writes into the display memory, but it doesn't support the use of an ANSI driver.

If your programs use the BIOS ser-

vices for screen output, they can run perfectly under *TopView*. Nothing needs to be done with a program that uses the BIOS services to make it work and look grand under *TopView*. Once again, though, the BIOS services are slow, and many program designers want the speed and snappy performance that comes with writing information directly into the display memory.

How does *TopView* accommodate programs that write into the display memory? *TopView* quite cleverly uses two ways; one method is for unruly programs that ignore *TopView* and work directly with the display memory, and the other method is for programs that adjust themselves to *TopView* but still do direct screen output.

For programs doing direct screen output, *TopView* only lets these programs operate when it can give them the full use of the screen, without any interference with other programs. When anything else needs to be shown on the screen, *TopView* saves what the program wrote there, and then shows the other information. Before the program can continue, all its display information is restored to the screen in original form.

TopView Features

Working that way, however, prevents you from deriving many of the benefits from a windowing system such as *TopView*. With these unruly programs, *TopView* can't shift the information around on the screen for our convenience and can't use such valuable *TopView* features as zooming, unzooming, scrolling, moving, and sizing.

Although *TopView* can't force windowing onto programs, it can work with programs that still do direct screen output. And, best of all, *TopView* provides this feature, so that it works evenly whether our programs are running under *TopView* or without it. That means that your programs don't have to include a pile of *TopView*-specific codes. Instead, with a slight modification, your pro-

LePrint™

Letter Quality for your Dot-Matrix Printer

IBM® PC
WordStar®
Edition

Now supports
Epson® LQ-1500™ Printer (and 37 others)

13 Type Styles

3 Standard:
Courier 10
Pica 10
Times Roman
Times Italic

8 Optional:
Clarendon
Letter Gothic 12
Helvetica
Swiss English

Special Characters
(abcdefghijklmnopqrstuvwxyz)
Math Symbols
(+,-,*,/,=,%,<,>,∞)
Special Symbols
(@, #, \$, %, ^, &, *, ~, !, ", ')

38 Printers

Apple: DMP
C. 10h 8510 Pro/Writer
1510 Pro/Writer II
Epson: LQ-1500
FX-80 FX-100 MX-80
MX-100 RX-80 RX-100
Hewlett-Packard:
HP 2225 ThankJet
IBM: Graphics
Infomaker:
Ritenas 15 Ritenas II
Ritenas Plus
Ritenas Plus Plus
Mannemann Tally:
Sprint
Mitsubishi: Super 3 CP-80
NEC: P2 Hewlett
P5 Hewlett
Olivetti:
ML-92 ML-93
Pentacomp 2410
Panasonic:
KX-P1090 KX-P1091
KX-P1092 KX-P1093
KX-P1160

Star Micrologic:
Delta-10 Delta-15
Genesis-10K Genesis-17K
Radio-10 Radio-15
Tandy/Radio Shack:
DMF-2100
Toshiba:
P140 P150 P151
Additional printers are being
added.

LePrint takes advantage of the graphics capability of your dot-matrix printer to produce high quality characters in a wide variety of type styles and sizes.

LePrint's growing Type Library contains a variety of distinctive fixed pitch and proportionally-spaced type styles. Each type style can be printed in sizes from under 1/12 inch (this size) to over 10 inches high. You can easily print multiple type styles and sizes on a page or even on a single line!

LePrint produces true proportionally-spaced and micro-justified text whose typeset appearance is easy to read and conveys a professional image.

Best of all, this edition of LePrint is designed specifically for use with WordStar. LePrint can print your existing WordStar documents without modification—including embedded print controls and dot commands. If you know WordStar you already know LePrint.

Ask your dealer for a LePrint demonstration and a copy of our free 12-page brochure. If you prefer, call us toll-free for more information or use your credit card to order direct with our 30-day refund offer.

Only \$149
(includes 3 standard type styles;
additional styles just \$19 each)

Call Toll-Free
800-LEBAUGH
(800-532-2844)
In Nebraska 402-733-7600

Dealer and Distributor inquiries invited



LeBaugh Software Corporation
2720 Grecco Avenue
Omaha, Nebraska 68147

Copyright © 1984, LeBaugh Software Corporation. All text printed by LeBaugh.
Epson is a registered trademark of Epson Corporation. LQ-1500 is a trademark of Epson America, Inc.
IBM is a registered trademark of International Business Machines Corporation. WordStar is a registered trademark of MicroPro International.

CIRCLE 303 ON READER SERVICE CARD

NORTON CHRONICLES

grams can automatically adjust themselves to the *TopView* environment without adjusting to *TopView*.

With this technique, which lets our programs write direct screen output and still lets *TopView* window, scroll, and zoom the results, *TopView* provides your programs with a substitute screen memory buffer. And with this buffer in hand, your programs can write output directly into this memory (just as they do with the display screen's own memory)—which is a fast and efficient method. Still, *TopView* controls where and how the information in this substitute buffer finally appears in the true display buffer and therefore on the display screen.

Thus we get the best of both worlds—the speed of direct output and the control of windowing operations.

Talking to TopView

Naturally, our programs must first talk to *TopView*—to find the location of the substitute display buffer and later must inform *TopView* of when the buffer information is ready to be shown. That's why this method doesn't work for existing programs but does work for those that have been specially modified for *TopView*. This technique is particularly clever because it uses only two simple bits of special code and no logic. By no logic, I mean that your programs don't have to act differently depending on whether they are running under *TopView*. They just have to do these two special operations that will work correctly whether or not *TopView* is active.

Both operations are new BIOS calls designed so that if *TopView* isn't running, nothing happens when your programs use them. The first permits our programs to ask *TopView* where the substitute display buffer is. If *TopView* is present, it gives the location of the substitute buffer, and we can use it. If *TopView* isn't there, we can use the standard location of the true display buffer.

The second service is used each time your programs have generated informa-

tion ready to be seen by you. It works the same way—if *TopView* is running, it acts on the program's request and shows what your program has placed in the substitute

buffer. If *TopView* isn't running, this service does nothing.

In a future column, I will tell you more about the inner workings of *TopView*. ■

BE 95% CERTAIN 100% OF THE TIME

INTRODUCING MACRO*TRACK.
A POWERFUL EARLY WARNING ECONOMIC FORECASTING
SYSTEM. THE FIRST OF THE NEW EXPERT SYSTEMS
FOR BUSINESS AND INVESTING.

UNIQUE. MACRO*TRACK is the only system to package high powered analysis in easy to use software that gives you fast, reliable, automatic forecasts of the business outlook — and at your own risk level — up to 95% certainty.

- First developed to detect major turning points in the business cycle.
- First to give early warning of sudden changes in the economy.
- First to be completely self contained with 20 years of history.
- First to outperform larger models costing thousands of dollars.

RELIABLE. MACRO*TRACK has given at least 6 months advance warning for all of the major economic turning points over the last 10 years.

PROFITABLE. For investment timing, MACRO*TRACK's guide for stock, bond and money markets has provided results over the last 25 years that are within 85% of perfect timing.

POWERFUL. MACRO*TRACK's proprietary method objectively analyzes 30 of the most used and important business indicators — Interest Rates, GNP, Inflation, Stock Indexes, etc. — to give you the best forecasts available.

EASY-TO-USE. There is no data to enter or equations to specify. And you can command MACRO*TRACK by using only three keys.

WHY TAKE CHANCES? No other software has the built-in intelligence, no other comes with complete database, no other is designed for the busy decision-maker and no other gives the fast, reliable answers you need.

ORDER MACRO*TRACK TODAY! Only \$224.95. For Apple II/III/IV, IBM PC/XT (2 disk drives) and compatibles. Demo \$10. Ask your dealer or call 1-919-924-6389.

MACRO*TRACK is a trademark of Black River Software. Registered trademarks Apple by Apple Computer, Inc. and IBM by International Business Machines Corp.

Black River Software™

111 N. Marshall, Suite 150 • Winston-Salem, NC 27101

CIRCLE 111 ON READER SERVICE CARD

CITIZENS
AGAINST UGLINESS,
UNRELIABILITY,
HASSLES AND
HIGH PRICES.



Introducing the Citizens.
Four economical new dot matrix printers, precision-engineered by the people who've become a wristhold word in fine, precision-engineered watches.



The Citizens are very sleek, very quiet, and reliable as the day is long.

They're IBM®- or Epson®-compatible, with output speeds of 160 cps (40 cps correspondence-quality) or a blazing 200 cps (50 cps correspondence-quality).

They're also exceptionally easy to use, thanks to our unique new push-feed paper loading system.

And if all this weren't enough to tick off the competition, wait'll you see what a value Citizen™ is for the money.

The MSP-10 and 15, and the MSP-20 and 25 Citizens. Stop by one of our dealers today and watch what the Citizens can do for you.

For more information, call 1-800-556-1234, Ext. 34.

In California, 1-800-441-2345,

Ext. 34. Or write Citizen

America Corporation, 2425 Colorado Avenue,
Santa Monica, CA 90404.

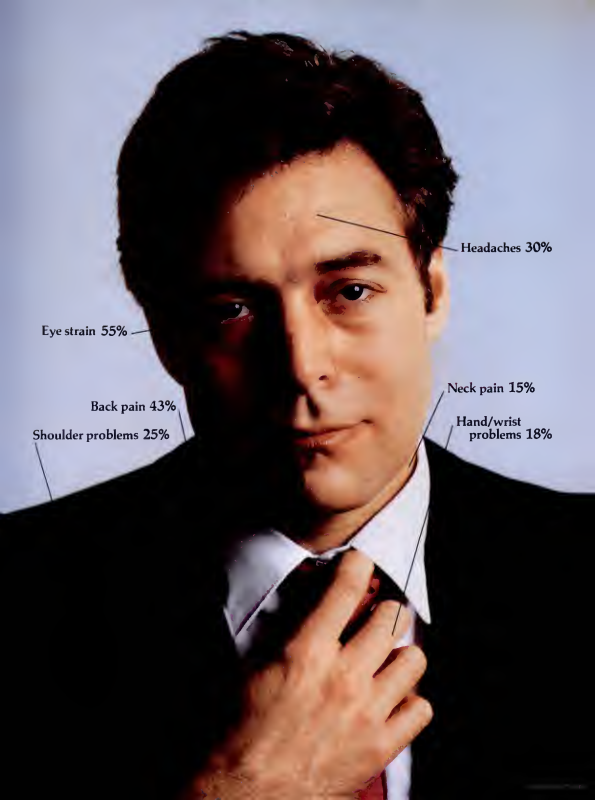


CITIZEN™

© 1984 Citizen America Corporation

Citizen and the Citizen logo are trademarks of Citizen America Corporation. IBM is a registered trademark of International Business Machines Corporation. Epson is a registered trademark of Epson Corporation.





Headaches 30%

Eye strain 55%

Back pain 43%

Shoulder problems 25%

Neck pain 15%

Hand/wrist
problems 18%

Computers can only perform as well as the people who use them.

The chart below is disturbing. It shows the kinds of problems computer users are having.

Computer-induced problems (%)	
Eye strain	55%
Back pain	43%
Headaches	30%
Shoulder	25%
Hand/wrist	18%
Neck pain	15%

(Source: "Ergonomic Principles in Office Automation." Pub. 1983 by E.I.S. AB, Sweden.)

Before you dismiss them as trivial, consider two things: First, more than twenty states

are now preparing legislation to protect computer users from problems like these.

Second, it's not just a people problem.

It's a business problem. Because computers do what they're told.

And if someone with a headache or eyestrain is doing the telling, they're likely to make mistakes.

Quite clearly, it's in everyone's interest to solve the problem.

You are not a machine.

As you would expect, computers are designed by engineers.

They usually know a lot about technology but very little about people. And even less about ergonomics.

Which is why so many computers are technically impressive yet strangely unnatural to use.

Ericsson, in its very Swedish way, has always believed that excellent ergonomic design isn't a privilege. It's a right.

That it isn't just a noble gesture. That it's demonstrably good business.

Because computers can perform only as well as the people who operate them.

It's an attitude that has made Ericsson No. 1 in Europe twice over:

As the giant of European telecommunications.

And as the biggest European workstation company by far.

(You couldn't ask for a better marriage of technology for the future.)

Here is one example of how Ericsson got there.

It's the first of a whole range of computers to be introduced in the U.S.A.

The Ericsson P.C. It's Ergo-Intelligent.™

Ericsson has spent \$300 million finding ways to make computers more ergonomically intelligent.

Here are some of the results.

Ergo-Screen.™

Aspirin gets rid of a headache. Ergonomics gets rid of the cause.

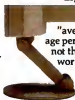
The characters are amber on a specially developed low-fatigue background color.

Even the shape of the characters was specially developed to allow easier recognition of difficult to distinguish letters like O and Q.

On the monochrome monitor, the resolution is double that of IBM's, so clarity is remarkable.

You can even have text and graphics at the same time.

Ergo-Arm.™



A computer is designed for the "average" person. The average person is 5'9". If you're not that height, the computer world has a simple answer. It's your problem.

Ericsson disagrees. Your monitor comes with an Ergo-Arm that lets you move and angle your screen exactly where it suits you.

Far better than back pain, wouldn't you agree?

Ergo-Touch.™

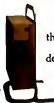
The keys are full-size and the layout is ergonomically planned for greater accuracy and speed.

Yet the keyboard is 20% more compact and less than half the weight of IBM's.

Even the cord is adjustable to suit left- or right-handers.

Ergo-Color.™

Even the color of the case is ergonomically selected to be restful to the eye over many hours.



Ergo-Space.™

The system unit is one-third smaller than IBM's.

It even fits under your desk in a special vertical rack.

So your desktop is your own again.

IBM Compatible.

Many companies claim to be compatible.

Some are. Some are stretching the truth.

The Ericsson PC boasts the highest compatibility rating there is.

It's operationally compatible. You can take advantage of thousands of PC-compatible programs already available.

In fact, with the best-selling software, program and data disks are interchangeable with those of the IBM PC.

Service. Not Excuses.

Ericsson wouldn't give you anything less than on-site or carry-in service.

The choice is yours.

3 Free Offers.

Ericsson will send you revealing literature on ergonomics.

Also a detailed brochure on the Ericsson PC.

And arrange a hands-on test if you ask for it.

Call toll-free 1-800-FOR-ERGO.



ERICSSON 

THE WRITE

Alphacom THE WRITE IMPRESSION

An open letter on
making a better impact
with your printer

There is nothing like a daisy wheel printer for making a crisp, solid impression. Print your important business correspondence on the Alphacom Alphapro 101 and you'll make a superior impact, with printing quality that you can actually feel.

The Alphapro 101 strikes the page with fully formed characters, powerful boldfacing, true descenders, clean underlining and more, so you can get the most from your word processing and other software.

You can get this authentic letter quality from a matrix printer. You can afford the striking impact produced by the Alphapro 101. The difference is in the impression you'll make on your important correspondence.

Alphacom Alphapro 101

IMPRESSION.

Impact of a daisy. Price of a dot matrix.

A daisy printer prints with *impact*.
It makes an impression on the page with each
and every character.

An impression you can see, and feel.
An impression no dot matrix printer or laser
printer or inkjet printer can make.

Now there is a professional quality daisy wheel
printer with a retail list price of only \$399.

And at twenty characters per second,
it has the kind of performance
you demand.

Now you can afford a
printer just for making
good impressions.

The Alphapro 101 will make millions of
good impressions.

In fact, it is delivered with a *full one-
year warranty!*

The Alphapro 101 doesn't cut corners.

It's simply designed smarter. With far fewer
moving parts. With fewer things to go wrong, you
save over the years. That's why it's the only low-
priced, high-performance, daisy printer that offers
a full, one-year warranty.

Built to give you the most out of the
leading word processing software and
personal computers.

Not just compatibility.

But full advantage of the superscripts, sub-
scripts, underlining, boldface, and other highlighting
techniques you get with packages like Wordstar,[®]
Microsoft[®] Word, or PFS[®]: Write.

And Alphacom's intelligent printer cartridge system
tailors the Alphapro 101 to run with *all* popular
personal computers. Apple[®] IIc[®] and IIe.[®]

IBM[®] PC, XT, AT,[®] Jr. IBM com-
patibles. Radio Shack[®]

AT&T. You name it.

Compare price and
performance. Then buy.
Don't let your image wait
another day.

See your Alphacom dealer for
a demonstration. Satisfy yourself
that this is, indeed, the finest value
in a personal printer.

Then put the Alphapro 101 to work
on your image right away.

For your local dealer,
call (408) 559-8000.



Alphacom

THE WRITE IMPRESSION.

CIRCLE 106 ON READER SERVICE CARD

Apple and AppleLink are trademarks of Apple Computer, Inc. Microsoft, Microsoft Corporation, PFS, Software Publishing Corporation, IBM, International Business Machines Corporation, Radio Shack, and IBM PC, XT, AT, Jr. IBM compatibles are trademarks of International Business Machines Corporation. Apple IIc and IIe are trademarks of Apple Computer, Inc. AT&T is a trademark of American Telephone and Telegraph Company.

copy 11/11/88

WHATEVER AILS YOUR PC.

Someday your PC will let you down. Don't let the machine's sophistication—or a repairman—intimidate you. Armed with the information in the following five articles, you needn't be helpless when your system fails.

Photography: Dennis Kichen

Diagrams: Andre Duzant





MAINTAIN YOUR SANITY: MAINTAIN YOUR DISK DRIVES

HENRY F. BEECHHOLD

Disk drives trouble is the greatest cause of downtime. If you keep them clean and lubricated and learn to trouble-shoot, you'll minimize repair bills—and lost time.

The major cause of computer downtime is disk drive failure. Every user at some point will go to boot up a disk and get a data error, seek error, or some other such annoying message in return. But before getting into the causes of disk drive failure, take a look at a typical disk drive, the full-height Tandon TM 100 that probably came with your PC.

Components of Disk Failure

Any disk drive is a hybrid device: part electromechanical and part electronic. The major mechanical components of a disk drive are the chassis, door mechanism, hub, drive motor, spindle, head-positioning motor and head assembly, logic board, and servo board. (See Figures 1 and 2 for illustration.) In the TM 100, the logic board and the servo board are separate, though in some makes, the servo circuitry is included on the logic board.

The chassis is mainly a casing to hold the various parts and assemblies. Although it has been demonstrated that uneven torquing of the mounting screws can deform the chassis enough to throw a head temporarily out of alignment, this rare occurrence primarily affects quad density (80-track-per-inch or 96-track-per-inch) drives.

The black plastic part of the drive holds the door assembly and the disk-retaining hub to which the door is attached. It is very unlikely that the doorlatch will malfunction, although the hub can be gummed up

through the use of do-it-yourself disk-hub-ring kits. A disk has a limited life, after all, and should be backed up long before the hub hole needs whatever reinforcement a hub ring presumably provides.

Delving deeper into the disk drive, you finally come to the heart of the matter, the machinery. To start, take a look at the drive motor and spindle. (See Figure 3.) The drive motor, one of two motors in a disk drive, causes the spindle to turn and in turn causes the disk itself to turn. The spindle is fitted with a hub on which the large center hole of the disk is positioned. When you close the disk drive, the disk is pressed into position by a hub clamp.

Four major problems are commonly associated with the drive motor and spindle: motor burnout, motor-bearing wear, drive-belt failure, and incorrect spin rate.

Occasionally, the spindle bearing acts up, causing the spindle to bind. If spin-rate deviation is caused by an electronic problem, it can probably be corrected by tweaking the servo pot, a variable resistor known in the Tandon TM 100 as R4. If the motor is going bad, however, tweaking will only provide fleeting relief. A slipping drive belt will also cause irregularities in spin rate. And, of course, a broken belt puts the spin rate at a rock-solid zero.

The head-positioning motor quickly and accurately steps the head(s) back and forth over the read/write slot of the disk. The grinding or buzzing sounds emitted when the disk drive is

active are made by the head stepper at work. The primary cause of failure here is misalignment of the head(s). This misalignment can result from rough handling of the disk drive, wear, or heat.

Tandon drives get warm in the best of circumstances. Should the computer be operating in a particularly stuffy environment, therefore, don't be surprised if the drives become erratic. And don't try to fix anything yourself. Head alignment should be done by a professional who has the proper tools.

The task of the computer is to obey the commands that come through DOS.

The practical implementation of those commands, however, is carried out by the floppy disk controller board (FDCB) in conjunction with the logic board—the circuitry on the disk drive itself. (See Figure



DISK DRIVES

4.) The FDCB, referred to by IBM as the Diskette Adapter Board, is installed in one of your computer's expansion slots. The FDCB can be the source of disk drive misbehavior, but the only practical way to ascertain its state of health is to substitute a controller board you know is good. Servicing a floppy disk controller board is not a job for just anyone. Warning: Before handling any plug-in boards, discharge any static charge you have (static electricity kills electronic components!) Then

place the loose board, circuitry side down, on a piece of aluminum foil.

The Chain of Commands

If you tell the computer to read a file, appropriate signals, sent first to the FDC and then to the disk drive logic board, cause the disk drive motor to turn on, load the read/write head, and move the head stepper back and forth across the surface of the disk. Considering the amount of carefully coordinated electronic and electro-

mechanical activity going on, this system works remarkably well. Still, mishaps occur—some IC or other will get flaky, or a capacitor or transistor will open or short out. And unfortunately, these repairs, too, must be sent out. Before packing anything up, though, try swapping boards. At least in the case of the FDCB, it's an easy enough task and may quickly root out the culprit.

Swapping circuit boards is also a good idea if there are problems with the servo

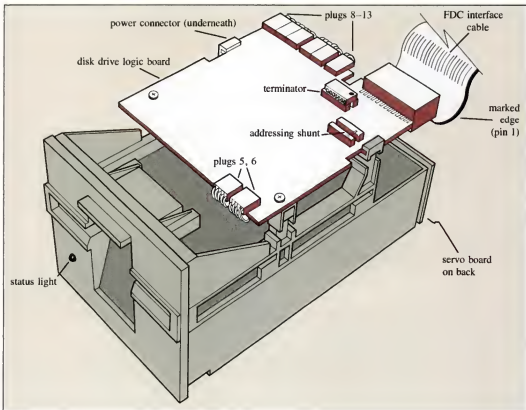


Figure 1: Overview of Tandon TM 100 disk-drive interior.

board. Or, if that doesn't work, you can try adjusting the spin rate with the spindle-speed-adjustment control (R4 on Tandon's TM 100) mentioned earlier.

Tandon's TM 100 manual does a good job of detailing all of these problems and more. The manual organizes the disk drive activity into seven functional groups and lists malfunctions associated with each grouping. These include:

1. Index-pulse shaper, consisting of an LED, a phototransistor, and pulse-shaping circuitry. The pulse shaper turns the interruptions of light caused by the disk's index hole passing over the LED into a standard digital data stream. LEDs burn out and phototransistors fail—both problems are jobs for the professional.

2. Write-protect sensor, which senses when the write-protect notch on the disk is covered, closes a microswitch, and causes inhibition of the write function.

3. Track 00 sensor. The track 00 position is home base for the head stepper. If the drive is out of alignment, it can't read track 00 of the disk and will crash.

4. Spindle-drive control, which I have already discussed.

5. Carriage-position control.

6. Write/erase control.

7. Read amplifier and digitizer. These groupings comprise the major part of the logic board electronics.

Different Problems

Floppy disk drives are either single or double sided. A single-sided disk drive has only one read/write head. When used in the single-density mode, this drive is the most reliable type. Double-sided disk drives have two heads, the second of which is located where the single-sided drive has a simple pressure pad. Dual-headed drives are more susceptible to misalignment than single-headed drives, especially in double- and quadruple-density modes. The older IBMs have single-sided

drives (writing double density), whereas the newer computers come with double-sided drives (also double density). The recording density is under the control of the FDC board, meaning that any disk drive can be made to read and write double-density information. Extended densities can also be squeezed out of these drives. However, where quad density will be used consistently, designers generally specify 80-track (96 tracks per inch) instead of the "normal" 40-track (48 tpi)

Dual-headed drives are more susceptible to misalignment than single-headed drives, especially in double- and quadruple-density modes.

drives. Bear in mind, though, that an 80-track width is so narrow that even the slightest deviation from spec will throw the system into a tizzy.

The FDC board talks to the disk drives over a standard 34-conductor cable. Once in a while, a disk drive problem can be ascribed to a defective cable or connector.

The process of formatting a disk on computer is very similar to making a standard tape recording. The information that the drive records is digital, however, meaning that there is a magnetic pattern understood by the system as 1s and 0s, as opposed to the analog information recorded in the magnetic material of recording tape. The formatting procedure works by

setting up a set of digital pigeon holes that the operating system uses for storing and retrieving your files. Since files are recorded in little packages not necessarily contiguous with one another, formatting also provides pointers or "road signs" to help the operating system keep everything organized.

Tools for the Good Disk-keeper

Disk drives are partially mechanical devices, and, like living rooms, they accumulate dirt and dust and must be maintained on a regular schedule. Several tools and materials are needed to perform this "disk-keeping" task. They include:

- Vacuum cleaner, battery-operated, flashlight-sized, with soft utility brush. When you vacuum, place the cleaner itself as far from the equipment as possible and aim the exhaust in the opposite direction.

- Compressed air. This is available at the photo shop in an aerosol can. Radio Shack calls it Dust/Particle Remover. Animal hairs and little bits of stuff seem to be more easily dislodged by a blast of air than they are by suction. Use the plastic nozzle that is provided, and while you blast away, suck the flying debris up with the vacuum cleaner.

- Isopropyl alcohol, uncolored type. Ethyl alcohol will do just as well, as will tape-head cleaner. (RS Cat. #44-4010 or 44-1171).

- Swabs. When I go on a cleaning binge, I find that no-name brand cotton swabs answer my needs very nicely. Radio shack sells reusable lintless foam swabs with long handles for \$1.95 per 10 swabs (Cat. #44-1094). However, I'm not convinced that these do as good a job as the no-names.

- Cleaner/degreaser. For cleaning connector contacts.

- High-quality lubricant. A Teflon based lubricant, such as Jensen TriFlow, is pref-

erable, but Radio Shack's Precision Oiler will do nicely. Nyoil and 3-in-1 are also good machine-oil lubricants but should not be used on rubber or plastic. And, of course, there's always the gunsmith's favorite, WD-40, a versatile cleaner/lubricant.

- Pink eraser. For burnishing contacts.
- Miniature screwdriver, large needle, or polished wood toothpick (round cross section, with sharp tips)—for lubricating tight spaces.
- Technical manual for your brand of disk drive. This isn't an absolute necessity, but for routine maintenance, it's nice to know what you're playing around with.

And, of course, you'll need your regular tools, such as dentist's mirror, tweezers, small screwdrivers, and vicegrips for disassembly and assembly of equipment.

Disk drive maintenance should be performed every 100 hours of use or every 6 months, whichever one comes first. Warning: On dual-sided drives, closing the drive door without inserting a disk (or thin piece of cardboard cut like a disk) can damage one or both of the heads. This kind of damage is not a problem with single-sided drives because the pressure pad is soft and won't hurt the head even if it touches it.

Tuning Up for a Better Drive

Maintenance on any brand of disk drive is basically the same. The only differences are the location of some connectors and some screws and a few other odds and ends that won't matter to what we're doing here. However, for purposes of illustration, assume here that you have just removed the drives of the Tandon TM 100 from the computer enclosure.

Below are the steps you will want to take to keep that disk drive in perfect running condition.

1. Gently pull all the plugs from their connectors. On the Tandon drives, the

plugs will be numbered 5 and 6 (to the right front of the logic board), 8, 9, 10, 11, 12, and 13 (to the left rear of the logic board), and 20 and 21 (on the servo board

the plugs off. And note where each goes. The four rightmost plugs in the rear bank are not used.)

2. Remove the logic board by taking out the two Phillips screws and sliding the board back to the cut-out. Place the board, with the circuitry side down, on foil or conductive foam.

3. Clean the interior of the drive with compressed air. Use small, precisely aimed blasts. Be careful not to touch the heads with the nozzle.

4. Check the condition of the drive belt. If it slips easily or shows wear, replace it. Turn the flywheel (the wheel with the stroboscopic pattern) to test for smooth movement. If there seems to be any binding, the drive motor may be going bad, the drive motor may need lubrication, and/or the

at the back of the drive). (Warning: Don't yank these plugs. The wires, especially to plugs 5 and 6, are quite fine and can be easily broken or pulled loose. Gently work

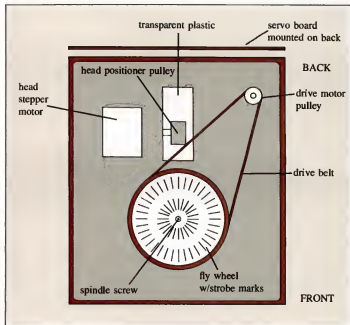


Figure 2: Underside view of disk-drive interior.

spindle bearing may need lubrication.

5. Lubricate the drive motor. First remove the plastic cap on the top of the motor and put a drop of lubricant on the bearing point in the center. Next, turn the drive over and with a miniature screwdriver, a large needle, or even a toothpick, put a drop of lubricant on the drive shaft in that tight space between the pulley and the body of the motor. It's important that this drop work its way down the shaft to the bearing. When you're finished, rotate the spindle to work the lubricant in and replace the plastic cap. Note: WD-40 has a limited lifespan on the job. For longer-term oiling, use TriFlow or fine machine oil (3-in-1 or Nyoil).

6. Lubricate the spindle. The only semi-handy place to lubricate the spindle

is beneath the hub on the top side of the drive. Using a miniature screwdriver (or needle or toothpick), dribble in a drop or two of lubricant. Take great care not to touch the heads or to bend anything. Next, rotate the spindle to work in the lubricant.

7. Lubricate the head stepper. Once again, you must apply the lubricant with a fine tool to the space where the motor shaft of the stepper motor enters the body. You can get at this juncture from the top of the drive. Slide the head carriage gently back and forth a few times to work the lubricant in. (Warning: When moving the head carriage, grasp it by the plastic guide at the right front of the assembly. *Do not handle the top head assembly.*)

8. Clean the heads and carriage. Light-

ly dampen a swab with tape-head cleaner or isopropyl alcohol; then, with a gentle circular motion, swab the bottom head and then the top head. Repeat this action with a second and even a third swab. To clean the top head, place the swab on the bottom head and press upward. The swab should eventually come away clean. Don't allow alcohol to dribble around the head mountings. The carriage rails can be cleaned by swabbing them with a small amount of cleaner/degreaser and then sliding the carriage assembly back and forth. (Note: I do not recommend using disk-type head cleaners. These can cause premature head wear.)

9. Lubricate the carriage rails. You should put a drop or two of the lubricant on a swab and brush it onto each of the two rails, then move the carriage assembly back and forth a couple of times. You want to leave only a very thin film of lubricant behind.

10. Lubricate the door assembly. Rub the swab you just used on the two flanges inside the door handle. Don't add any lubricant. All you need here is the lightest film.

11. Clean the connectors. Moisten a clean piece of cloth with cleaner/degreaser and rub the pin connectors on the servo board until they are bright and shiny. Repeat for the pin connectors on the logic board. Pencil erase the flat finger connectors (right rear of board) to remove static electricity and then clean off with cleaner/degreaser. Blow the board clean and dry with compressed air.

12. Replug the servo-board connectors.

13. Replace the logic board and replug the connectors.

14. Two-drive users should go back to step one.

15. Replace the drive(s), the power plug, and the disk-drive cable. The power cable can be inserted only one way, but an

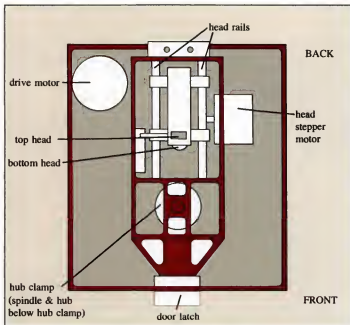


Figure 3: Overview of disk-drive interior with logic board removed.

unkeyed disk-drive connector can be misconnected. Pin 1, whose cable is marked by a colored stripe, should be to the right as you face the front of the drive.

16. Reassemble your computer, and fire it up for testing. All should be well. If not, open it up and check the connectors for correct placement.

Searching for Culprits

Unfortunately, even if you maintain your disk drive perfectly, there may be times when everything doesn't function as expected. To prepare you for this eventuality, I recommend two documents: the *Technical Reference Manual* for your computer and the technical manual for

your brand of disk drive. There is no sense in pawing around hoping to happen upon what the problem is. We need all the help we can get.

In certain cases, you're told to return the unit to your dealer for repair. And unless you intend to become your neighborhood disk-drive repair person, you're better off letting the specialists handle the sticky problems. Before trekking off to the computer store, however, first check the obvious. Here's a list of problems, possible causes, and remedies.

If the drive doesn't respond when you issue the boot command (the busy light doesn't come on):

- Your disk drive cable may not be

securely plugged into its socket.

- You may have a defective cable (one or more broken conductors). Replace it.
- The power-supply cable is not securely plugged into the power receptacle on the disk drive.
- You have problems on your FDC board and/or disk drive logic board. Substitute boards if possible; if not, send it for repair.

If your disk-busy light turns on when you give the boot command, but the disk will not boot:

- You have no system on the disk.
- The disk is defective.
- The spin rate is out of spec. Check and adjust it.
- The drive belt is broken or off the pulley. Replace it.
- The drive motor is binding. You must lubricate it.
- The head-stepper motor is binding. Clean and lubricate it.
- The drive motor and/or head-stepper motor has burned out. Send the drive for repair.
- You have a defective terminator. Replace it. (Note: In a two-drive system, there should be only one terminator. Normally it is mounted on the drive that is at the end of the disk drive connecting cable, regardless of whether the drive has been designated A: or B:.)
- The head is misaligned. Send the drive for repair.
- The head is dirty. Clean it.
- The head is defective. Send the drive for repair.
- The disk pressure pad is worn down (single-sided drives). Replace it or send drive for repair.
- There is a weak spring on the pressure-pad arm (single-sided drives). Replace it or send drive for repair.
- Your index sensor is burned out. Send the drive for repair.
- You have a faulty FDC board and/or

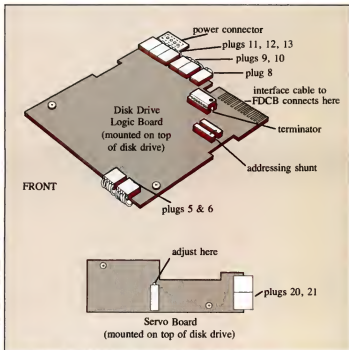


Figure 4: Overview of disk drive logic board and servo board.

disk drive logic board. Substitute if possible; if not, send the drive for repair.

- You have a defective system ROM. Substitute a working ROM. This problem is uncommon.
- You have a defective CPU, clock, bus controller, or other system board component. Troubleshoot, substituting chips where feasible. This problem is also uncommon.

If you get busy lights from two (or more) disk drives when you access the system:

- The disk drive cable is plugged in backwards. Remove it; then reconnect it, making sure that pin 1 on the cable connectors is properly mated with pin 1 of the FDC

Unless you intend to become your neighborhood disk-drive repair person, you're better off letting the specialists handle the sticky problems.

board and the disk-drive logic board.

- The disk drives are improperly addressed. Check the addressing shunts and readdress correctly.

If you have problems inserting or removing disks:

- The head is not released from the read/write (loaded) position. Turn the system off and then on. Try to insert a scratch disk.
- The springs or catches are bent or broken. Turn off the system. Then open the disk drive, remove the logic board, and use a scratch disk to observe what's happening. Repair the problem if possible, or

else send the drive for repair.

- The drive hub is gummed up with adhesive from hub rings. Carefully clean the hub with lint-free cloth moistened with lighter fluid.
- A write-protect or other label is stuck somewhere in the disk pathway. Remove it and carefully clean off the adhesive.

Good Driving Advice

I have a few additional bits of advice that can save you money, time, and aggravation.

Where feasible, check several things at the same time. For example, you can easily check the drive motor, the cleanliness of the head(s), and the cleanliness of the head carriage rails at pretty much the same time. At any rate, on the basis of your best judgment, go first to the most likely source of the problem at hand.

Never use force on anything in a disk drive—with the exception of a frozen drive motor that you've just lubricated. Forcing here should be of a very gentle sort. Lubrication should be applied sparingly to the area where the motor shaft enters the motor housing and to the area where the shaft can be seen on the top of the motor housing. Do not allow lubricant to dribble anywhere else.

Replacement pressure pads, springs, and other little odds and ends can be ordered from companies that specialize in disk-drive sales and repair.

It's a good idea to comparison shop for disk-drive service. The dealer you bought your computer from may neither be the best place for service nor the least expensive. You can usually get worthwhile guidance from computer club or user group members.

Buy a spare disk drive—even two—so that you won't be out of business when your regular ones go on the blink. You can own a new replacement drive for the cost of two to three repair jobs. And do your

own replacement. It will cost you as much as \$75 to have the job done. Working slowly, you can replace a drive in your PC or PCjr. in less than an hour.

Don't feel obligated to replace a disk

Don't feel obligated to replace a disk drive with one of the same brand.

drive with one of the same brand. You'll be paying a premium for the IBM logo, beneath which is another maker's disk drive. My recommendation is for the brushless, direct-drive type of drive available from mail-order houses for as little as \$150 each. Just make sure that you get the correct size (full height or half height) and that the vendor assures you that the drive is PC compatible, which most are.

Don't leap in and try to do a job that you neither fully understand nor have the proper equipment to tackle.

A little time spent on mothering your disk drives will put you in good stead over the long haul. Use your expensive piece of productivity software to remind you when the drives should be taken care of and to keep a record of your ministrations—sort of like the lube-and-oil-change sticker on the door frame of your car. Good luck and good driving!

*Dr. Henry F. Beechhold is a professor of English and chairman of the Linguistics Department at Trenton State College. He is the author of *Simon & Schuster's Plain English Repair and Maintenance Guide for Home Computers and the Maintenance and Repair Guide for PCs and PC Compatibles*, to be published by Simon & Schuster this year.*

CIRCUIT BOARD HOME REMEDIES

GENE B. WILLIAMS

With your PC making its own diagnosis, it won't be hard for you to track down the problem—and perhaps effect a cure.

Fantastic as it may sound, a weird coincidence accompanied the writing of this article. I sat down at the computer and flipped the switch. Instead of its usual reliable operation, my computer gave out a long beep, followed by a short one. This is the signal given by the power-on self-test (POST) to indicate there's a problem with the system board. So, before I could write this article on how to diagnose and repair circuit boards, I was obliged to diagnose and repair my own.

Despite the reliability of the PC, at times something will go wrong. You don't have to be a trained technician to find the source of the malfunction. If you can operate your PC, you can diagnose it. And most of the time, you can fix it yourself, saving both time and money. The job isn't as difficult as it might sound. The computer will take care of most of the problems if you let it. It will let you know what is going on before a problem becomes more serious.

Each time you turn on your IBM PC, the computer automatically implements the first step for diagnosis by going through POST, which takes anywhere from a few seconds to a couple of minutes, depending on what you have installed. The more memory you have, the longer POST will take.

Along with a check of the memory, POST also runs a quick check on the rest of the system (system board, keyboard, monitor adapter card, printer card, drive adapter card, and so on) to verify that everything is functioning as it should. It signals audibly, and sometimes with writ-

ten codes, if it finds something wrong.

Normal response is for the computer to give off a single, short beep just before the LED on the drive lights up and the program begins to load.

Anything other than this tells you something is wrong. For example, a long beep followed by a short beep indicates that the system board is malfunctioning or about to malfunction. A series of short beeps tells you the power supply is bad or is being dragged down by a short elsewhere in the computer. (See Figure 1.)

POST is always your first step in the diagnosis of a problem. It's also something you don't have to think about doing, since it runs automatically every time you turn on the computer.

Dr. Disk

If you get an error during POST or while operating, you can get out the diagnostics floppy disk that came with your computer or an advanced version of the same thing (available at your dealer). For circuit board problems, use the multiple

testing option (option "1" on the menu that appears after you've entered the diagnostics routine). You may not catch the trouble with fewer than 25 testings. (When I was diagnosing the problem with my PC, it wasn't until the 31st pass that the errors began to show.)

Each question mark in the codes listed in Figure 2 means that any number displayed in that spot—other than zero—denotes an error. For example, an error code of "201" indicates a problem with RAM; a "200" means the RAM tested

successfully. (The only exception is a "199" error, which simply means that you answered "no" to the "Is this list correct?" prompt at the beginning of the routine.)

After running the diagnostics routine and making a note of any error codes, it's still not time to open the computer. Check for the obvious. Are all external connections secure? A cable between the computer and an external device may have come loose. This check includes the power cord.

If the board indicated by POST codes is connected to something outside the cabinet, such as the monitor or printer, disconnect the external device and run the test again. A bad device can easily make the adapter board seem to be malfunctioning, while in fact it is the external device (or the cable to it) that is causing the problem. If the problem is in the device, the error code should disappear when the device is disconnected. Naturally, if the fault is in the board, the error code will remain. (Always be sure and play it safe. Shut off the power



before making or breaking any electrical connections!)

Check the cables and other connectors for continuity with a VOM (volt/ohm meter) to be sure the problem isn't caused by the cable. Set the VOM to read resistance in the $1x$ range. Touch the black lead to the pin on one side of the cable and the red lead to the same pin on the other side. If the wire is broken inside the cable, you'll get an infinite resistance reading. Depending on the VOM you are using, the needle of the meter will either swing to the

far side of the scale or not move at all. Either way, most meters have an infinity symbol (∞) to mark the spot. A reading of infinite ohms means the circuit is broken and no contact is being made. If the wire is good, the reading will be near zero ohms.

Be sure that you know which pins are which before you proceed. Often a ribbon cable will have a number of pins that will not be used for a particular application. If the documentation that came with the device doesn't tell you, you may have to

take apart the connector head to determine how the pins and wires are used.

Under the Hood

If you still haven't found the problem, it's time to open the cabinet. Again, look for the obvious. Is there anything that could be causing a short, such as a screw or small piece of metal? Has an internal cable come loose? Look at everything carefully. With the power off, disconnect and reconnect each cable (*carefully!*).

Check the switch settings, both on the

Signal	Cause
Nothing, continuous beep, or series of short beeps	Power supply
1 long beep and 1 short	System board
1 long beep and 2 short, or normal short beep but blank display	Monitor adapter card and/or monitor and/or monitor cable
Normal short beep with either the drive LED staying on or cassette BASIC loading	Drive and/or drive adapter card

Figure 1: POST's audio codes and the parts in which they indicate problems.

Code	Meaning	Code	Meaning
02??	Power	9??	Printer adapter
1??	System board	11??	Async port
2??	RAM	13??	Game control
3??	Keyboard	14??	Printer
4??	Monochrome monitor	15??	SDLC adapter
5??	Color monitor	17??	Winchester drive
6??	Drives	18??	Expansion chassis
7??	Coprocessor	20??	BSC adapter

Figure 2: Written POST error codes and the parts in which they indicate problems.

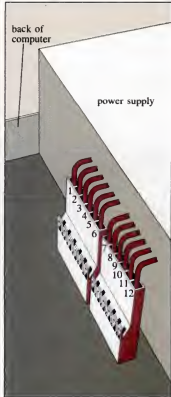


Figure 3: Pin numbers of the system board.

system board and on the expansion boards. This check is important if you've made any changes to your system. The switches tell the computer what to look for. If they're set incorrectly, you're bound to have improper operation.

A new board may have spots that have to be jumpered (or unjumpered). Read the instructions carefully. You're unlikely to cause any damage by not having the jumper connection blocks correct, but operation could be strange.

Are all the boards tight in their slots? And all the chips firm in their sockets? Either can work loose and cause an apparent malfunction. A gentle push will reseal the boards or chips. If reseating doesn't work, remove the boards and clean the contacts using a special contact cleaner—not a cleaner with a lubricant such as the kind meant for TV tuners—or using technical-grade isopropyl alcohol and a swab. (Don't use rubbing alcohol; it may contain water, oils, and other contaminants.) Or you can clean the contacts using a soft pencil eraser. Do this off from the computer, and blow off the eraser tailings before reinserting the boards.

Don't forget to shut off the power before you take out or insert anything! If power is flowing and you yank out a board, you could easily end up causing considerable damage to the computer.

Occasionally, a malfunctioning power supply can make something else seem to be faulty. It can also work the other way around, with a bad board causing the power supply to fail.

To test the second possibility, remove all boards and options and try again. If the system now powers up, insert the boards one at a time, making sure you shut down the power before removing or installing a board. When the computer fails again, you'll have found the board that is causing the problem.

You can test the power supply easily

with a VOM. It connects to the system board through the 12-pin connector located next to the power supply. (See Figure 3.) Pin 1 is closest to the rear of the computer. Pin 2 is empty. You can test the voltages either with the supply still connected or with the plugs disconnected. (If you decide to check the voltages with the plugs disconnected, be sure you shut off the computer before unplugging the connectors.) If the voltages don't match those in Figure 4, the problem isn't in a board at all but in the power supply.

The switches tell the computer what to look for. If they're set incorrectly, you're bound to have improper operation.

You can test the system board further by checking the resistance across the power connector pins. You do this check with the power off and the power supply to the board connectors unplugged. Set the VOM to read resistance in the $1x$ range. Unplug the two power connectors and take the readings according to Figure 5. The readings you get should be fairly close to the ones listed there. Any reading below those in Figure 5, or any reading of infinity, could indicate that the system board has failed.

RAM Repairs

If the problem is in RAM, locating the faulty module is easy. The computer will tell you exactly which one it is through the

use of a code. The first two digits tell you the bank; the last two tell you the specific module in that bank.

The older system boards hold only 64K on the system board itself. Newer boards can hold up to 256K on the system board. Either way, the chips on the system board are divided into 4 banks, from bank 0 to bank 3. Bank 0 is farthest back on both. Bank 4 is the first bank of RAM on an expansion card.

Bank 0 will generate a 00 code for the first two digits on both the new and the old boards. (See Figure 6.) The other banks generate different codes depending on the board type.

On both types, the modules are arranged the same way, with nine chips per bank (data bits 0 through 7, with the parity bit as the ninth.) On each bank, the chip nearest the edge represents the parity bit. There is a space between this chip and the data bit chips, with bit 0 being the first (closest to the parity bit chips) and bit 7 being toward the center of the board. (See Figure 7.)

Thus, an error code of 2020 tells you the failing module is in the bit 5 chip of bank 2, when you have a 256K system board. A code of 0002 indicates that the bit 1 module (second from the left of the bit modules) of bank 0 (farthest back) is at fault.

To test the module, simply swap it with another chip. The address for the error should change. For example, if the original error code was 0002, and you swap this for the bit 7 chip in the bank, the code should change to 0080. If you swap it for the same chip in the next bank, the code should change to 1002 (or 0402 with the 64K board).

Unless you can swap a chip or see obvious physical damage, repair is usually by replacement of the board. If this becomes necessary, keep in mind that the malfunctioning board has a trade-in value. You

CIRCUIT BOARDS

Common	+ Lead	Voltage
4	8	10.8-12.9
5	10	4.8-5.2
5	1	2.4-5.2
7	3	11.5-12.6
9	6	4.5-5.4

Figure 4: VOM/pin connections and voltage readings that indicate a properly functioning power supply.

Black	Red	Minimum Ohms
8	10	0.8
8	11	0.8
8	12	0.8
5	3	6
6	4	48
7	9	17

Figure 5: VOM/pin connections and the resistance readings that indicate a properly functioning power supply.

	64K Board	256K Board
Bank 0	00	00
Bank 1	04	10
Bank 2	08	20
Bank 3	0C	30

Figure 6: The first two digits—representing banks of chips—in the RAM codes.

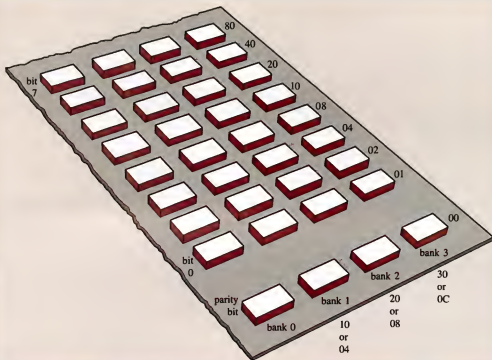


Figure 7: RAM address scheme for the four banks of chips on a system circuit board.

may also be able to find a refurbished board for considerably less than a new one. If you can't find a single RAM chip and have to buy a whole bank, keep the others around as spares. (Label the bad chip. It's still useful as a test chip.)

To review, be sure you've eliminated all the obvious things. A system board error could be caused by one of the ROM chips being loose. A screw or other conducting object can cause a variety of problems—or apparent ones. Sometimes you'll be able to tell a burned-out component by its appearance. You could even be

If the problem is in RAM, locating the faulty module is easy. The computer will tell you exactly which module it is, using a code.

making an error operating a program.

Once you've eliminated the obvious, make use of the diagnostics disk. A single pass may not reveal the trouble, so select the multiple testings option. If you can't sit there for the testings, select the "log utilities" option to keep track of errors.

Above all, don't panic. Take one step at a time. The process of elimination can take you a long way toward finding the actual cause of the problem. ■

Gene B. Williams is a freelance writer living in Mesa, Arizona. He is the author of How to Repair and Maintain Your IBM PC (Chilton Book Company, Radnor, PA, 1984), the first in a series of books on computer repair maintenance.



If you can operate a PC, you can probably repair it, too. Your computer will even take care of some of the problems by itself. Here the user is removing the circuit board (top), testing the system board resistance (middle), and using an extracting tool to swap chips around (bottom).

COVER STORY

POWER PLAYS & PERIPHERALS

GENE B. WILLIAMS

"Is it plugged in?" is the first question to ask when your PC won't run. Though the problems are usually more complex than this, diagnosing them is not as hard as you think.





Few things are more frustrating than when your computer doesn't work right. One is when it doesn't work at all. When nothing happens, the power supply may be the cause. But problems with power supplies and peripherals aren't always obvious, and diagnosing them seems more difficult than it really is. Finding out what's wrong, however, simply involves eliminating other causes and making a few easy measurements with a voltmeter.

Diagnostics Steps

When something doesn't work, your first step should always be to proceed con-

servatively and look for the most likely cause. Be sure all cables and connectors are secure, including the power cord. If the printer is malfunctioning, also check to see that the mechanical parts are clear, without paper jammed inside. Don't forget to check the fuses, if there are any. (You cannot check the PC fuse, nor can you replace it without a great deal of effort. But it will automatically reset itself if you shut off power for 5 seconds.)

The power-on self-test (POST) runs a quick check automatically on your system each time you turn on the computer. The diagnostics diskette does more to help spot

problems. If at all possible, use both *before* tearing things apart. If both these fail to yield the answer, try the methods given in the next section in this article; then use the diagnostics diskette as soon as you have power again.

POST and the diagnostics diskette generate signals and error codes that will help you find the problem quickly. Make a note of them. The *x*'s in Figure 1 can be any numbers. A code number followed by zeros means that the test was completed successfully. For example, a code of 300 means that the keyboard has tested successfully. A code of 301 means that you have a problem with the keyboard.

Some companies' options, those not "approved" by IBM, may give false readings during diagnostic procedures. Keep this in mind while trying to find the problem. Diagnostics might indicate that there's a problem with the graphics card, for example, when in fact that device is fine. Make it a point to run the diagnostic routines whenever you install something new so you know what will show during the testing. (It's also a good idea to run the diagnostics diskette regularly as a step in "preventive medicine.")

Nothing Happens

If nothing happens when you flip the power switch, you are likely to accuse the power supply without thinking further. The power supply may have died, but also something else could have gone awry. (This applies too when a printer or other peripheral doesn't run. Read more on peripheral power supplies below.)

The fan is wired directly to the incoming 120-volt line. If the fan isn't working, chances are the problem is outside the computer. (It's rare for the fan and the power supply to give out at the same time.) If the fan is operating, the power is probably getting to the computer.

The next time you switch on your com-

Code or Signal	Meaning
Nothing	Power
-or-	
Continuous beep	
-or-	
Repeating beeps	
-or-	
02x displayed	
No input	Keyboard
-or-	
30x or xx30x	
1 long beep, 2 short	Monitor
-or-	
1 short beep & incorrect display	
-or-	
4xx (monochrome)	
-or-	
5xx (color)	
No printing	Printer
-or-	
9xx	
-or-	
14xx	

Note: For a more complete listing of diagnostics error codes and signals, see "Circuit Board Home Remedies" in this issue.

Figure 1: Diagnostics error codes.

puter, listen carefully for a slight "click" coming from the speaker. This click means that power is getting to the system board. If you hear the click, the power supply is probably functioning properly, with the problem occurring elsewhere in the system. (This assumption isn't necessarily true, but use it as a general guideline.)

The best way to check for incoming power is with a voltmeter (set for 120 volts AC), but you can use a lamp for a quick but less-reliable test. The power supply of the PC can operate in the range of 104 to 127 volts. Other power supplies will have different tolerances for power. If the incoming power goes beyond the tolerance of the power supply, everything (except the fan) will shut down. (Since a lamp will operate beyond the tolerance of many power supplies, it may not show any apparent difference when you use it instead of a voltmeter for your test.)

Your computer will also shut itself down if something draws too much power from it. If a multifunction card develops an internal short, for example, it could draw too much power. An occurrence of this type is rare, but it can happen.

If the problem is in one of the connected devices (printer, modem, option cards, and so forth), you can locate it simply by disconnecting them and checking for power again. (Don't forget: the keyboard is also a connected device.) Shut down all power and disconnect everything connected to the computer externally. Apply power again. If there's still no power, open the cabinet and carefully remove all internal options (with the power off!). Pay particular attention to the drives.

If you have power flowing again, you know that one of the devices is at fault. To find out which one it is, merely plug them in one at a time (with the power shut down each time!) until the power fails again.

If you still don't have power, check the

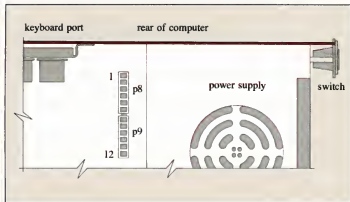


Figure 2: Power connector to the system board indicating pin numbers.

+ pin	- pin	reading
8	4	10.8 - 12.9
1	5	2.4 - 5.2
10	5	4.8 - 5.2
3	7	11.5 - 12.6
6	9	4.5 - 5.4

Figure 3: System board power connector readings.

output of the power supply itself. This step involves using your multimeter set to the 12-volt DC range. The first test points are where the cable from the power supply plugs into the system board (see Figure 2). The power is on during this test; so be very careful and do not cause any accidental shorts. Move slowly and methodically.

Check each pair of pins for the correct voltage range. Check the other pins. Figure 2 gives the pin locations. Refer to Figure 3 for the correct voltage readings on the pins.

The power supply also powers the disk drives. The power connector is located at the left rear of the drive circuit board (Figure 4). Most drives have four pins on top of the circuit board. You don't even have

to unplug the connector. Touch the common (black) probe to pin 2 and the positive (red) probe to pin 4. A reading between 4.8 and 5.2 volts is okay. Between pin 3 (black) and pin 1 (red) you should get a reading of from 11.5 to 12.6 volts.

If any of these voltages are incorrect, you'll know that the power supply is the problem. All you can do is replace the faulty unit (with an exact match). Otherwise, the problem is in one of the connected devices. Or you have too many options attached and are simply trying to pull more from the power supply than it can give.

The Keyboard

Quite a few people have complained about the PC keyboard. Most complaints

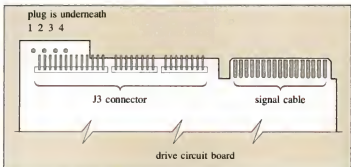


Figure 4: Power connector to the disk drive.



Figure 5: Underneath each key is a small spring—the only part likely to wear out.

focus on the layout or on what the keyboard lacks in the way of features. As a unit of construction, however, the PC keyboard is rather nice. There are no contacts, as such, and therefore there's no chance of arcing or other electronic wear to the keys.

Under each key is a small spring (see Figure 5), which is the only part of the key that experiences wear to any extent. It moves a small plastic paddle beneath the key (causing the little click you hear). The motion of the paddle changes the capacitance in a cell below the key. It is the change in capacitance that makes the keyboard work. The electronics of the key-

board read this change and send the signals to the computer.

With or without an error code, if you have reason to suspect that the keyboard is malfunctioning, check the voltages. Remove the keyboard plug from the back of the computer. Set your meter to read in the 6-volt DC range. The common (ground) should go to pin 4. Touching the other pins should give you a reading of between 2 and 5.5 volts. If any of the voltages are incorrect, the problem is inside the computer. If the power supply has tested correctly from above, the trouble is probably in the system board (see "Circuit Board Home Remedies" in this issue for more

information on how you can test the system board). Otherwise the problem is either in the cable or somewhere in the keyboard.

Before you give up and toss the keyboard in the garbage, you should check the continuity of the keyboard cable. It's unlikely that one of the wires inside is causing the trouble, but it's a possibility. In order to check for continuity, remove the cable from both the keyboard and the computer; then set your meter to read ohms ($\times 1$). Touch the probes to the ends of each wire (pin 1 to pin 1, and so forth—see Figure 6).

Printers

The manual that came with your printer is the best source for specific information. Become familiar with it to find out what capabilities your printer has and how to take care of various possible problems when they arise.

Since the printer is a mechanical as well as electronic device, it is prone to more wear and tear than most things connected to the computer. It has at least two motors (for head and platen) and maybe more. The printhead moves back and forth across the platen and also either spins (as with a daisywheel printer) or makes characters by punching at the paper with wires (dot matrix type printer). All this motion causes wear. It can also create fair amounts of heat, which, if allowed to build up, can cause all sorts of damage, both mechanical and electrical.

The first thing to look at is the manual. Specific error signals displayed there may tell you what has gone wrong. Also included will be information specific to your printer, such as how to remove the platen and other parts to free up a paper jam, how to load the ribbon, and so forth.

Paper can jam as it feeds through the printer. Even single sheets can cause a

paper jam. Printers that use multiple sheets are even more prone to jams. When a jam occurs, the printer can grind to a halt. Sometimes the jam isn't apparent. Look carefully.

All sorts of strange things can happen if the ribbon isn't installed properly. Part of a character might print, leaving the other part weak or gone completely. The printer could shut down entirely, or print a couple of characters and then act as though the signal had stopped.

You can make lots of adjustments with most printers—the usual spacing and forms thickness adjustments, the release catches, plus others. Just as a typewriter won't function properly if the adjustments aren't correct, neither will a printer. Checking for these things entails looking for the obvious. Most of the time, the problem will be very simple.

By doing occasional maintenance checks and cleaning the printer regularly, you can greatly reduce the malfunctions. Clean the ribbon guides, the print shield, and the inside of the machine. A build-up of ink or paper dust can cause problems. If your printer has a built-in self-test, run it occasionally. (Run it once when you first get the machine to see what the test should look like.)

The printer self-test allows you to carry your diagnostic procedures one step further. If the test shows that the printer is operating correctly, you'll know that the problem is in the printer interface, the cable, or the computer. You can eliminate the cable by testing for continuity with your meter. The diagnostics diskette is able to tell you if the printer adapter card is functioning in the correct manner. About the only thing left is the interface in the printer itself.

Monitors

Monitor problems are usually obvious: the screen will be blank, or the display will

Monitor "repair" really means "replace" in almost all cases. But don't forget that your old expansion board will probably have trade-in value.

be strange. Unfortunately, "repair" normally involves replacing the entire unit. In any case, there's high-voltage current inside the monitor, plus an all-too-delicate CRT tube. So *stay out*, unless you know what you're doing.

These same symptoms could also simply mean that the adjustments are off. This is the first thing to check if the monitor is blank or garbled.

Next, check the cables, the connectors, and the monitor driver board inside the computer. With the power off, unplug and reconnect each one in turn; then try again.

Take a moment to check the cables for continuity.

If POST and/or the diagnostics diskette indicate a malfunction, most likely the circuit board is at fault. An audio signal indicates monitor problems (one long beep and two short), and so even if you can't see anything on the screen, you can still run the test. The visible error code is 4xx for a monochrome screen and 5xx for a color monitor.

Testing involves using another monitor, another cable, and perhaps another adapter card (one at a time, through a process of elimination). If a different monitor works with your computer, for example, the original monitor is at fault. If your own monitor works on another computer, the cable or the adapter card is causing the trouble.

"Repair" really means "replace" in almost all cases. But don't forget that your old expansion board will probably have trade-in value to someone. Even a malfunctioning monitor might be worth something, although you'll be glad to get rid of it and have your system powered up and ready to go again. After all, power's the key, and nothing's worse when your computer doesn't have the power to do what you want. ■

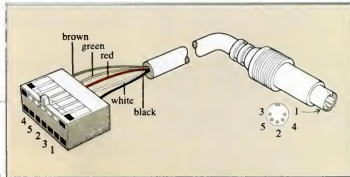
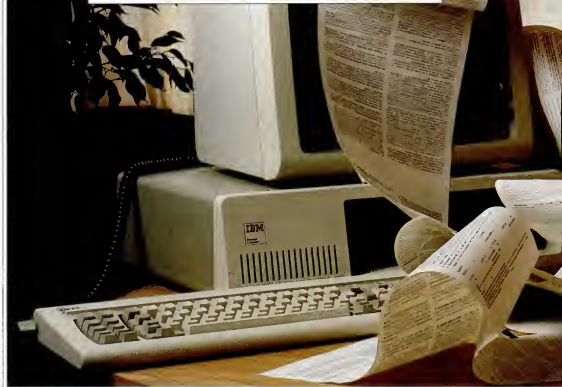


Figure 6: Keyboard cable locations. Blacked-in slots are unused.

TAKING OUT A CONTRACT ON YOUR PC

WENDY LEA McKIBBIN

Service contracts take the worry out of maintaining your PC. Available from various sources, they give you peace of mind—provided you sign up with the right company.





When John Browning bought an IBM PC for his small accounting business in San Francisco, he didn't worry too much about maintenance. The new system was under warranty, and if he was going to spend more money, he preferred investing it in a few enhancements rather than in a service contract. After all, didn't the salesman at the retail outlet promise support if anything went wrong?

For the most part, John's faith was justified. He used the system an average of 40 hours a week the first year, with never a moment's trouble. Considering John's situation, this record was really quite remarkable.

Three chain smokers shared his large one-room office in an old Victorian building, where, with no air conditioning, open windows let in ample amounts of dust and grit. (No one had bothered to explain to John that smoke and airborne debris can leave a damaging film on the disk drive head.) Another important fact had escaped his notice—the building's old wiring produced an uneven circuit that sagged and spiked. John never thought to buy surge protection for his system. He had, instead, added a hard disk, a multifunction board from a third-party vendor, a modem, and a high-resolution color monitor.

John was no doubt on the road to a repair bill. The situation came to a head in a dramatic way. One morning, at the peak of John's business cycle, an electrical storm left part of the city without electricity for 2 hours. The storm not only caused John's system to crash, destroying an entire morning's work, but left in its wake a critically damaged disk drive and an impaired memory board.

Frantic, John made a beeline to his original point-of-sale contact, only to find that the store's single technician had a 1-week backlog of repair jobs. And sorry, he was told, but customers with service contracts come first. The store couldn't help

him at all with the now out-of-warranty hard disk drive, which had been purchased through a mail-order firm.

If this story makes your heart beat faster, you probably purchased your PC for your business, as John did. At least half of all the units installed today are owned by individuals like you with businesses to run. Unless your corporation issued you a PC under the benevolent dictatorship of



probably minimize downtime and save you money. It's no secret that service dealers put the needs of their contract clients before those of their incidental customers. And if you want the uninterrupted service you get with a swap-out program or a loaned PC, a contract can guarantee it for you. If you know you can't be without your system for a single day, you can buy a policy that ensures on-site service within 4

It's no secret that service dealers put the needs of their contract clients before those of other customers.

the data processing department, you're probably on your own for maintenance. Even if you purchased a system with funds from the departmental budget, you may still be one of hundreds of business users who don't have a contract or a contingency plan for ailing equipment.

Insure Against Disaster

According to Prognostics, Inc., a firm based in Palo Alto, California, the average failure rate for a business PC not under warranty is twice a year. The most frequent failures involve printers and disk drives, followed by memory boards and keyboards. Maintenance can become fairly expensive if you have to pay for labor plus parts at cost every time the system goes down.

The sensible approach to maintenance? Consider buying a policy from one of several sources. A good service contract can

hours of your call. You'll also be ensuring your peaceful sleep.

Although you might not see a financial benefit from a contract in the first year, a service agreement is likely to save you money over a 3- to 5-year period. A \$600-a-year contract covering all parts and labor would more than pay for itself if you had to replace your \$1,500 disk drive.

Smorgasbord of Service

The menu of maintenance options for the individual PC owner is extensive. Choices include the manufacturer, IBM; third-party maintenance vendors like Sorbus, Honeywell, Control Data, General Electric, and Xerox; dealers and distributors like ComputerLand and Businessland; specialty micro maintenance chain stores like Serviceland and Computer Doctor; and miscellaneous local shops, including some TV and electronics stores.

IBM extended its service coverage recently. It now includes all equipment sold through IBM product centers. The small but growing list now includes AST Research's five multifunction boards, the Hayes Smartmodem, the Epson FX-100 and MX-100 printers, the Okidata M-L 93 printer, and the NEC 3550 Spinwriter.

The new service contract from Big Blue offers five options: IBM on-site exchange, IBM on-site repair, customer on-site exchange, customer carry-in exchange, and customer carry-in repair. Translation: you can only repair, not exchange, the system unit itself. Either an IBM service rep comes to your house or office and fixes it (IBM on-site repair), or you take the system to a walk-in center (customer carry-in repair).

The exchange policies cover monitors, keyboards, and printers. You either have a service rep come to your system site and do the disconnecting and reconnecting for you (IBM on-site exchange), or you take the defective part to a nearby company outlet and get a new one (customer carry-in exchange). The final option, customer on-site exchange, means that IBM delivers the new unit to your door, but you install it yourself.

Big Blue, It's You

It's now easier than ever to have IBM fulfill your requirements for service. Whether you live in the Big Apple, San Juan, Puerto Rico, or Desolation, Montana, you can get attention for your service needs. Mileage restrictions no longer exclude customers in outlying areas. Nor does it matter if your warranty has expired. You can still buy an Annual Maintenance Agreement from IBM. You can choose from a variety of options including exchange, repair, on-site service, and carry-in service, depending on your circumstances and budget requirements. A single payment covers all normal maintenance,

no matter how often you need service.

Because of recent policy change at IBM, owners are no longer required to have their computer routinely inspected before obtaining a contract. Instead, the new contract includes a certification letter stating that your machine is in good working order and that you'll agree to make your machine available for inspection within 1 month of signing the contract.

IBM owners are no longer required to have their computers routinely inspected before obtaining a service contract.

Aside from psychological comfort, contracting with IBM offers some solid advantages, notably readily available parts and the expertise one would expect from a manufacturer.

But the IBM solution has some limitations. Third-party vendors are pouring out enhancements for the PC and PC-XT, but IBM's service policy covers few of these products. They will service two printers, the Epson FX-100 and the Okidata Microline 93, as well as a few non-IBM adapter boards, such as the IRMA and six different AST cards. But if you have a diverse configuration of hardware and prefer the convenience of service from a single source, you may have to go with a third-party maintenance (TPM) vendor like Sorbus.

TPM Contracts

Most major TPM vendors offer three types of yearly contracts: on-site service,

depot service, and some form of mail-in, ship-in, or courier service. The standard turnaround time for on-site repairs is 24 hours, whereas depot and mail-in service can take anywhere from 1 day to 2 weeks. Although prices vary slightly, on-site service for a hypothetical configuration of an IBM PC-XT with a color monitor, an AST SixPakPlus board, and an Epson FX-100 printer costs roughly \$900. (The ServiceLand contract is clearly a bargain at \$665 for 12 months.) But don't choke; there's at least one alternative. Mail-in and carry-in service cost at least 20 to 40 percent less than on-site repair.

If you don't have a contract, you can still get service on a time and materials basis. But be prepared for a flat labor charge of up to \$100 per hour, plus the cost of parts.

They Promised Support

Maintenance through the dealer or distributor will probably be comparable in quality with other sources on the market. But remember: These people are primarily interested in selling. Even though it's to their obvious advantage to keep you the customer happy through post-sales support, their technical staff may be skeletal and supplies scanty. Turnaround time could be slow, and in some cases, on-site service may not be available.

Beware, too, of nontransferable contracts. If you purchased a service contract from a ComputerLand in downtown Chicago, for example, and then moved to the suburbs, at present you could not transfer your contract to another local store. ComputerLand may change this policy in the near future, but be sure you don't unwittingly enter into such a contract if your future may include transfer to another location.

On the positive side, the dealer or distributor is the only source, other than the software manufacturer, that offers some

form of software support. And in the final analysis, the sales relationship may work to your advantage, since the dealer is unquestionably interested in repeat sales. So if you're trying to make a maintenance choice between a local TV store that services micros and the retail store that sold you your system, you might find that your contact at the point of sale has that added incentive.

Bargain Hunting

One of the latest entrants in the maintenance market is the PC service chain store, a new type of organization that promises to offer fast and economical service. The best-known examples are Computer Doctor, based in Pleasantville, New York, and Serviceland, headquartered in Westlake, California. Each plans to open nationwide outlets within the next 13 months. Both offer on-site, courier, and carry-in service of comparable quality at moderate prices.

The big question is, will they last? According to Input, a California-based research firm that follows maintenance trends, service chain stores face two major obstacles to success. Input says that it can cost up to \$1 million to properly staff and launch a micro maintenance store. And these stores face a tough tussle for the maintenance dollar, pitted as they are against large, established service vendors and manufacturers. So before you buy a service contract with a chain store, evaluate the tenure of the organization. If they do manage to achieve their potential, however, these service outlets will probably offer one of the best maintenance bargains on the market.

Discriminating Choice

A bargain price is just one aspect of an appropriate maintenance agreement. And in fact, it may be the least of your concerns. To discriminate among IBM, your

Comparison Shopping for Service Contracts

All contracts are for a sample system—IBM PC-XT with IBM color monitor, AST SixPakPlus multifunction card, and Epson FX-100 printer. The rates are for a 1-year contract, including all parts and labor, with 24-hour response to on-site calls.

Manufacturer

Company	On-Site		Notes
IBM	\$968.00	(IBM on-site exchange for display and printer)	For on-site service, the system unit is automatically charged the IBM on-site repair rate. However, the rates for the display and printer can vary.
	\$913.00	(Customer on-site exchange for display and printer)	
	Carry-In \$634.00	(Carry-in repair for system unit, display, and printer)	The mail-in choice is no longer a separate contract option but has been incorporated into carry-in service. (Call (800) 428-2569 for more information on mail-in procedures.)
	\$624.00	(Carry-in exchange for display and printer)	

Third-Party Maintenance Vendors

Company	On-Site	Carry-In	Mail-In	Notes
Sorbus	\$918.00 (or \$76.50 per month)	\$545.40	\$545.40	Sorbus bills monthly for on-site service. (For more information, call (800) 423-2797, or (818) 502-1946 within California.)
Honeywell	\$935.00	\$635.00	\$785.00 (Pick-up and delivery)	(For more information, call (800) 282-4350.)
Control Data Corp.	\$966.00 (Available in 15–16 major metropolitan areas)		\$792.00 (24-hour courier service)	CDC encourages on-site repair for at-home users. (For more information, call (800) 346-6789.)
			\$588.00 (Ship-in) (3–5 days)	

SERVICE CONTRACTS

Third-Party Maintenance Vendors (continued)

Company	On-Site	Carry-In	Mail-In	Notes
Xerox	\$819.00 (Begins surcharging after 25 miles)	\$525.00 (2-day service)	\$525.00 (2-day service)	Under some contracts, you may be required to pay a percentage of parts' cost. (For more information, call (800) 238-2300.)
General Electric	\$720.00	\$660.00 (3-day turnaround)	\$660.00 (3-day turnaround)	These rates are for West Coast. Rates vary according to locale. (For more information, call (800) 634-0001.)

Dealer/Distributor

Company	On-Site	Carry-In	Mail-In	Notes
Computer-Land (picked at random in Chicago)	\$1200.00 (36-hour turnaround)	\$650.00	\$650.00	Obviously, each store establishes its own rates and policies.
Computer-Land (picked at random in Boston)	\$799.68– \$932.96	\$533.12– \$666.40	Same as carry-in	On-site service is available within 25-mile radius of store. Lowest prices are for systems purchased through store.
Computer-Land (picked at random in San Francisco)	None	\$350.00 (3–5 day turnaround)	\$350.00	

Micro Maintenance Chain Stores

Company	On-Site	Carry-In	Mail-In	Notes
Serviceland	\$665.00	\$460.00	\$460.00 (plus shipping costs one-way)	Courier for business customers only. (For more information, call (805) 495-8045.)
Computer Doctor	\$840.00	\$504.00	\$672.00	Surcharge for on-site service after 50 miles. (For more information, call (914) 747-2777.)

—W.L.M.

dealer, a TPM, a service chain store, or a local electronics shop, first analyze your situation realistically. Look at price, of course. But also assess how much downtime you would be able to tolerate and whether loaned equipment or exchange units are available. Also, consider convenience. Nothing is more convenient than on-site service, but it is also the most costly coverage. Decide whether it is feasible for you to trade off the hassle of transporting the equipment yourself for the economy of carry-in service.

If your system happens to be an amalgam of every new device available for the PC, select a service vendor that can handle all or most of them. Think about all of the possible contingencies. If you use a portable system on the road, for example, choose a contract from a company that has nationwide outlets, not one from a small, local shop.

Before You Sign

Note: Before you sign a contract with anyone, make sure that you fully understand the type of maintenance you are buying, whether it's for on-site, walk-in, or mail-in service. Look carefully at the fine print. Are there any clauses that cover escalating prices? Don't accept or settle for anything less than a full parts and service guarantee. Examine your prospective vendor thoroughly. Ask about the number and location of service centers. Try to get a written guarantee on turnaround time.

Perhaps most importantly, look for a service contract that includes some type of preventive maintenance measure. Make sure that you'll get a yearly tuneup to align the disk drives, adjust the printer, and check voltages. With a little intelligent forethought and careful planning, you should be able to avoid repeating John Browning's fiasco and ensure a more trouble-free life for your system, and for yourself.

KEEPING THE REPAIRMAN AWAY

DOROTHEA ATWATER

Don't be caught unaware: Someday your computer will let you down. Simple precautions and a spot checklist can help keep disaster away from your door.

Some day, your computer will stop," says the matter-of-fact advertisement of Sorbus/MAI, a national computer repair company. Although you may be horrified to think that your indispensable tool might let you down, you should be prepared for the worst. The good news is that more services are now available than ever before to fix your computer; the bad news is, most of them are unnecessary and expensive. However, you can do many things yourself to avoid the trouble of unnecessary repairs.

The number of companies available to repair your computer is growing by leaps and bounds. Several large electronics companies, including General Electric, Sorbus/MAI, Xerox, TRW, and Data Products, have seized the opportunity to increase their businesses by repairing other manufacturers' computers, terminals, and printers.

These companies offer what is called "third-party maintenance" for a wide variety of microcomputers, ranging from the PC and its lookalikes to Apple and Commodore machines. They hope that retail stores will parcel out service and repair contracts to them.

Many independent or discount store owners are only too happy to make such an arrangement. For computer retailers, the profit per square foot of store floorspace is what really counts. In-store service centers don't always contribute much to those figures, although some manufacturers require that their authorized dealers have them. By referring the customer to a large, third-party repair company, dealers not

only keep their profit margins up, they get customers off their backs and may even pocket a small referral fee or incentive.

Where does that arrangement leave you, the customer? National repair service fees start at around \$90 an hour. IBM charges \$96 an hour with a .7-hour minimum, plus parts and tax. That rate means you're looking at a minimum payment of around \$67. The Xerox Repair Division, which repairs over 50 different computers, printers, and monitors, charges a minimum of \$50 to check the unit, even if the problem is just a blown fuse.

Minimums

According to Earl Dennis, repair technician at one busy West Los Angeles computer outlet, it takes time to track down a problem over the phone or in the shop, and that costs money. "If a computer isn't broken, I sure don't want to see it," says Dennis "but this is a business, and if customers bring the machine in, no matter what is or isn't wrong with it, I'm going to have to charge them."

Most larger repair depot chains have minimum charges. They maintain an extensive inventory and must keep up with all the latest technical innovations, so they charge accordingly. The price of individual repairs depends on the complexity of the system in question, availability of parts, and simplicity of repair. The minimum charge at Xerox service centers covers the checkup and replacement of a blown fuse, for example. But if the inspection shows

something more serious is wrong, the technician will then give you an estimate for the remainder of the work. Service contract subscribers get a bit of a break: since they pay anywhere from \$199 a year to \$199 a month, they usually receive fast telephone troubleshooting assistance, which saves them a far more expensive on-site service call. Louis Sanno, field manager for Sorbus's Glendale, California, branch, explains how the company's 170 depots across the country handle trouble calls.

"When a client calls," he says, "our receptionist takes a message. She then refers the call to the appropriate service specialist. The client gets a call back from Sorbus within 30 minutes, and the specialist asks the questions to determine the nature of the problem and how urgent it is." In fact, Sorbus has recently developed an in-house comprehensive diagnostic program, called *The Investigator*, which has reduced the time needed to diagnose clients' computer problems. However, this program is used only by Sorbus technicians.



Human Error

Technicians unanimously say the most common problem isn't a hardware breakdown at all.

"The number one problem I see is what you could call pilot error," says Earl Dennis. The user just can't get a program to work properly. Dennis says some people refuse to acknowledge that nothing is wrong with their computers. "I had a new computer owner come back 2 weeks in a row, claiming the computer had lost data right off the screen. He packed in his entire unit, and I sat patiently beside him as he tried to replicate the situation in which the data had been lost. Nothing happened. He tried again. Still nothing. Experience told me that he was one of those panicky new owners who was absolutely convinced that he was doing everything right, although he had obviously overlooked a step somewhere."

Dennis says he finally told the customer that there was, in fact, nothing wrong with his computer.

"The customer asked, 'But what about what happened to me?' and I replied, 'Sometimes these things happen; it could have been a minor power dip, but there doesn't seem to be anything wrong with the computer.'

"The customer got flustered and said, 'Well, if you can't fix it, I'll just have to telephone the manufacturer!' and he packed up and left. Since then, he's gotten more familiar with his software program, and he's feeling better."

A Few Guidelines

Before taking your computer in for diagnosis, you can save both time and money by taking precautions and by following a few commonsense troubleshooting guidelines that can help you separate software problems from hardware problems and what is working from what isn't. The important thing is to

take nothing for granted: Start by making sure everything is plugged in. Here's a brief checklist:

- Have you followed all your cords and connections from the wall sockets right on through to the screen, making sure everything is plugged in correctly and securely?
- Have you tried using a different program on a different disk and gotten the

"The number one problem I see is what you could call pilot error. The user just can't get a program to work properly."

exact same result as before?

- Have you rebooted before trying the same thing again?
- Are you missing any essential messages on the screen?
- Has your software been correctly installed and configured for your system (PC and printer)?
- Have you changed anything recently, inserted a new RAM card yourself, for example?

While these questions may seem ridiculously basic, they will help narrow down the diagnosis, and, if they don't take care of the problem, will save costly time with your service technician. The final resort is to pack it all up and carry it in.

After human error and software have been ruled out as causes of your problems, the most common sources of computer breakdowns are in two major areas: disk drives and printers.

Disk Drives

Disk drives tend to get dirty and become oxidized from constantly moving over the disks. You can easily clean them yourself with a commercial head-cleaning kit. To save even more money, get an expert to show you how to do it with alcohol and cotton swabs. Some sources say heads should be cleaned after every 10 hours of continuous use. Others say every 6 months, so as not to wear down the heads. Some people have never cleaned their drive heads and swear they never will; they're afraid of wearing them down. On the other hand, service technicians have had to repair brand-new units out of the sealed factory boxes—by cleaning the filthy heads.

John Puccini, new products and marketing manager for Sorbus, recommends a moderate approach to head cleaning and explains that even if your computer is on 8 hours a day, your disk drive heads usually won't be active for the entire period. He does recommend that the heads be cleaned at the first sign of read/write trouble.

Other common problems with disk drives are caused by the heads going out of their high-precision alignment. Regular use gradually moves the heads out of position, and they must be realigned with an oscilloscope. Keeping your equipment stationary will help reduce the amount of servicing your disk drives will need. If you do have to move the equipment around, use the original cardboard disk drive braces to help protect them from jolts and bumps.

Printers

As with disk drives, heavily used printers will need servicing more often than lightly used ones. The most common printer problems involve bad cables, loose switches and connectors, and plain old dirt inside the unit, on the roller or platen, and

on the daisywheel. Reduce your frequency of repair by keeping the inside free of dust and dirt, occasionally cleaning the platen or roller with alcohol and lint-free cloth, and cleaning the carbon dust from your daisywheel with a small brush. Naturally, keeping your dust cover on whenever your printer is not in use will help prevent dirt buildup. As the saying goes, an ounce of prevention is worth a pound of cure.



Prevention

Although computer owners spend anywhere from \$3,000 to over \$10,000 on their equipment, they generally don't devote much thought to prevention. So, if you are in the glow of new computer ownership, now is the time to consider some safety precautions. Even if you've had your machine a while, you can cut down on your repair dollars through some simple measures, and there's no better time than right away.

Three everyday things can cause computer problems: heat, static electricity, and dust. Ideally you should take precautions against these dangers before your equipment is moved in. If your computer is in place, it still isn't too late.

Excessive heat is bad for all parts of your computer system. When considering where to put the equipment, pick an area

out of the direct heat of sunlight or a heater. High summer temperatures will also affect the computer—they can make perfectly good machines go slightly and temporarily batty. So, if you are working in a very warm room and your computer begins behaving differently, try turning your computer off altogether for a while and giving it a rest to cool it down. An air conditioner is also helpful, if it doesn't

Dust can convey static electricity within your computer and may cause a dangerous data loss if it contacts your disk drive head.

cause power fluctuations.

However, if you have a choice between an air conditioner that affects the power circuits by constantly cutting in and out, and slightly warmer temperatures, stay with the warmer room.

Static electricity is another hidden enemy. More prevalent in dryer climates, higher altitudes, and in areas prone to thunderstorms, static lurks in wall-to-wall rugs and dehumidified rooms. As you know, it's unpleasant enough for you to become electrically charged and "zap" yourself when you touch a doorknob or other metallic object. A shock can be even more unpleasant when it damages your computer memory, the program you are running, and your disks.

If you touch a disk and accidentally shock it, you are likely to lose whatever information you had stored on it. If you zap an operating computer, you are likely

to lose whatever is in the computer's memory at the time; you could also damage the internal microcircuits.

But you can reduce static hazard considerably and cheaply. Spray your rugs and curtains with antistatic spray. (When you use any kind of spray with a computer in the room, make sure that the disk drives, computer ventilation holes, and floppy disks are well covered. Otherwise the particles of spray can infiltrate these areas.) Although antistatic rubber floor pads can be expensive, consider using them under your chair to further protect your computer from accidental shocks. Do the same with your desktop: rest the computer on an antistatic rubber pad.

Dust

Dust is another danger. Not only does dust build up on the keys, the casing, and in the cracks of the keyboard, but it can seep through the computer's air vents and into the disk drives, where it will cause serious problems. It is wise to invest in dust covers for your computer and printer. Always keep the covers on when not using your equipment.

Dust can convey static electricity within your computer and may cause dangerous data loss if it contacts your disk drive head. A particle of dust may be only a few millionths of an inch thick, but it can do the same kind of damage as a bulldozer crossing your newly landscaped garden. It can prevent the head from recording a crucial bit of information onto your disk or cause the computer to misread a program instruction off the disk. The error might occur infrequently, which means the problem can be hard to detect—for you or your technician. You might have to make repeated trips for repair and you will lose confidence in the reliability of your equipment, not to mention your technician.

Don't forget to cover your equipment

PRINTER SWITCH

Intra's **Printer Switch** for all Personal and Business Computers lets your **WordProcessor's** copy be easily directed to either a **Dot Matrix** or **Letter Quality Daisywheel Printer**. Compatible with all Centronics Parallel type interfaces, the **Printer Switch** is styled to match computer hardware in the Home or Office.

\$165
Including
Cables



Intra
Computer

101 W. 31st Street
New York, N.Y. 10001
(212) 947-5533

CIRCLE 167 ON READER SERVICE CARD

KEDIT

Mainframe Editing Power (and more!) **\$125**

Announcing **KEDIT**, the most powerful full-screen text editor yet for the IBM PC. It provides facilities normally found only on mainframe computers and extends these facilities to take full advantage of the PC's keyboard, display, and dedicated processing power. Your PC will finally be equipped to handle even the most advanced editing applications.

- DOS 2 path and subdirectory support
- edit up to 15 files at once
- multiple display windows show you up to 8 files at once
- block move and copy, even between files
- sophisticated string search and change
- wordwrap, paragraph reformatting and justification
- all keys programmable with any combination of over 100 special functions
- DOS directory display

XEDIT Compatibility

XEDIT is IBM's text editor for the CMS operating system with most XEDIT capabilities, including

- | | | | |
|-------------------|-----------|-----------|---------------|
| ■ targets | ■ ARBCHAR | ■ RECOVER | ■ SCHANGE |
| ■ prefix commands | ■ GETFILE | ■ SORT | ■ named lines |

KEDIT requires:

IBM PC, XT, or AT / DOS 2.0 or later / 80 column display / 192K

For immediate shipment of **KEDIT** send check or money-order for \$125 plus \$3 shipping. CT residents add 7 1/2% sales tax. For more information call **203/429-8402**.

Demonstration disk available for **\$10**.

VISA and MasterCard accepted.



Mansfield Software Group, Box 532 / Storrs, CT 06268

CIRCLE 378 ON READER SERVICE CARD

REPAIRMAN

when the room is to be vacuumed. The dust stirred up then is even more likely than usual to find its way into vulnerable places. If you want to vacuum your keyboard, get a crack-and-crevice attachment for a small battery-operated vacuum cleaner (but don't put it near the disks: the motor has a magnetic field).

Your household electrical power circuits can be another source of hazard. The same interference that causes "snow" on your screen, such as a neighbor's power saw, a refrigerator, or a microwave oven, can cause your screen to go blank. Use a good line filter to eliminate noise and "spikes." Good ones are available for between \$45 and \$100. The investment is well worth it.

While Sorbus and other repair services are happy to help users solve their own problems, there is one repair that John Puccini cautions not to try yourself. "Never try to oil your printer," he says. "Many do-it-yourselfers are used to oiling any moving parts—on sewing machines, motors, and so on. But most printers have self-sealed bearings, so regular machine oil is disastrous." The other job he recommends leaving to an experienced technician is keyboard cleaning: "If you spill soda pop on your keyboard, the sugar can cause a chemical reaction that can affect the keyboard circuits. My advice would be to get the keyboard in for expert cleaning as soon as possible."

Last, in case of disaster, lessen your cost in time and inconvenience by backing up your data and software and storing it in a safe place. Then, if your computer is out of commission, you can borrow or rent another one and carry on.

Dorothea Atwater is a Los Angeles-based computer consultant and author. The first of her new book series, First Aid for Your IBM PC, for Ballantine Books, hits the stands in January.

FOR PEOPLE WHO THOUGHT THEY'D NEVER MEET THE PERFECT 10

We've got one to knock your socks off. The StarWriter™ Y10 from C. Itoh.

What sets this letter quality daisy wheel apart is its fabulous figure. Priced at only \$595.

This little beauty prints 22 letter perfect characters per second. And like the rest of C. Itoh's fine printers, the StarWriter Y10 acts without acting up.

That's because it has been thoroughly tested and proven on the job to assure reliability. And it comes with a full year's warranty, backed by over 400 authorized service centers coast to coast.

The Y10 is an awful lot of printer for very little money. But that's not surprising when you consider that C. Itoh's been producing superior printers for over a decade. What's more, it has the strong backing of our 126-year-old parent company with over \$60 billion in annual sales.

And the StarWriter Y10 is compatible with most of the popular PCs. It has a 256-byte buffer. And there is a full line of accessories available such as a cut sheet feeder and tractor feed.

Little wonder C. Itoh printers are No. 1 worldwide, with over 2.2 million sold annually. And with the StarWriter Y10 we're aiming to keep it that way.

To meet your own perfect 10, just see your local C. Itoh printer dealer. Or for more information call 1-800-423-0300.

Or write C. Itoh Digital Products, Inc., 19750 South Vermont Avenue, Suite 220, Torrance, CA 90502.



hett © 1984 News Group Chicago, Inc.

C. Itoh
DIGITAL PRODUCTS



™ StarWriter is a Trademark of C. Itoh Digital Products, Inc.
© 1985 C. Itoh Digital Products, Inc.

CIRCLE 146 ON READER SERVICE CARD

A Grand SLAM for Simulation

SLAM II, a specialized language for performing computer simulations, is now available for the PC. With it, you can model solutions to business problems.





The speed and accuracy of the computer have greatly changed the science of mathematical modeling in recent years. It is now possible to build and use models of truly astounding complexity. In fact, the computer has given birth to a new class of models—simulation models. Computer languages have developed apace. Now SLAM II, a language designed strictly for simulations, has been adapted for the PC.

SLAM II possesses a vast potential for saving untold hours of programming and testing time. To fully appreciate this new language's offerings, however, you'll need some background. A full review of SLAM II must begin with an explanation of simulations, include an example, and feature a discussion of the drawbacks of using a general-purpose language, such as BASIC, for simulations.

Instant Hindsight

To "simulate" is to look or act like something else. But, in the context of computer simulation, the word has come to mean specifically the modeling, in the form of a computer program, of a network of things that act upon each other to produce certain results. Simulation implies both the execution of this program, possibly yielding years worth of experience in a matter of minutes or hours, and the analysis of program output to reach conclusions. To understand how this actually works, consider the following hypothetical example.

You operate a store. Your customers

```

100 TIME.OF.DAY = 0
110 NUMB.OF.CUST = NUMB.OF.CUST + 1      ' Counting customers served
120 NUMB.OF.ITEMS = RND*10              ' Number of items on order
130 TIME.OF.DAY = TIME.OF.DAY + 2        ' 2 minutes to read order and
                                           ' walk to back room

140 FOR ITEM = 1 TO NUMB.OF.ITEMS
150   DISTANCE = RND*150
160   TIME.OF.DAY=TIME.OF.DAY+DISTANCE/200 ' determine distance to an item
                                           ' walking time at 200 ft/min
170 NEXT ITEM
180 TIME.OF.DAY = TIME.OF.DAY + 2        ' 1 minute to return to counter
190 FOR ITEM = 1 TO NUMB.OF.ITEMS
200   TIME.OF.DAY = TIME.OF.DAY + .1      ' 0.1 minute to ring up each item
210 NEXT ITEM
220 TIME.OF.DAY = TIME.OF.DAY + .5        ' 0.5 minute to take money
230 IF TIME.OF.DAY > 480 THEN 110         ' if the day not over, go to
                                           ' next customer
240 PRINT NUMB.OF.CUST                    ' else print the results

```

Figure 1: Simulation of store clerk-customer interactions in BASIC.

```

GEN,Test job,Store clerk,8/5/84,1      ' Job identification
LIMITS,2,2,100                         ' Run parameters
NETWORK
  CREATE,UNFNN(4),,1                    ' Defines beginning of network
                                           ' Creates a customer arrival every 4
                                           ' minutes
  QUEUE(1),1,100
  ACTIVITY(1),1,UNFNN(4.5,13,)          ' Arriving customers stand in queue
                                           ' The clerk requires between 4.5 and
                                           ' 13 minutes to serve a customer
  TERM
  END
INIT,0,480                              ' The transaction is terminated
                                           ' The model is complete
                                           ' The simulation is run for 480
                                           ' minutes
FIN                                       ' The input file ends

```

Figure 2: Simulation of store clerk-customer interactions in SLAM II.

arrive and line up at the counter with written orders. The clerks take the orders into the back room, pick out the desired items from stock, and return to the counter. Customer orders can vary from one to ten items, and the items on an order are randomly located in the back room. The question is, "How many customers can a single clerk serve in an 8-hour day?"

The BASIC program in Figure 1 gives us an answer of 74 customers. This program is a very simple simulation, designed strictly for illustration purposes. If you take the time to study it carefully, you will begin to understand what a simulation program is and how it works.

In effect, the listing in Figure 1 is a mathematical model of the interactions between clerks, orders, and stock. The variable TIME.OF.DAY represents the clock on the wall, the variable NUMB.OF.ITEMS represents the number of items on the order presently being sold, and so on.

The program in Figure 1 is extremely simple compared to real life. The model,

for instance, makes several erroneous assumptions. It assumes there is always a customer available to be served. It assumes that customers don't mind waiting in line and that the clerk makes no attempt to pick products off the shelf in any reasonable sequence. It also makes no allowance for reaching to top shelves or bending to bottom shelves or for handling heavy or bulky products, and it assumes all products can be brought back to the sales counter in a single trip. Relying on this simple model would lead to bad decision making, but, as you can imagine, a realistic version of this program would be far more difficult to write.

Within its limitations, however, the program serves its purpose of modeling the clerk's day, measuring the number of customers served, and reporting the results. Of course, a program enhancement would be helpful. You would want to keep track of the line of customers waiting for service, decide when each customer tires of waiting, and even keep track of the resulting lost business.



SLAM II

Pritsker & Associates, Inc.
P.O. Box 2413
West Lafayette, IN 47906
(317) 463-5557

List Price: \$975 (\$200 to colleges and universities)

Requires: 320K RAM, one disk drive, DOS 2.0.

CIRCLE 652 ON READER SERVICE CARD

The clerk-and-customer situation is a classic simulation problem. Computer simulation can also address computer-utilization studies, particularly in a multi-user environment with unpredictable or partly predictable workloads. Simulations are also helpful in transportation studies aimed at determining the best method of distributing empty railroad cars or of dispatching tugboats. Simulations have also proved useful in factory and warehouse layout studies seeking to maximize worker efficiency and effective use of space, as well as in marketing-research studies investigating the risks and possible benefits associated with new or changed products, distribution channels, prices, and service policies.

Simulation has become an established tool for many engineers and scientists because software models can be built and tested much more quickly and economically than can physical models. Years of experience with a process can be gained in hours. Some processes, such as a manned trip to Mars, for example, cannot be fully explored any other way.

BASIC Language Barriers

Although in Figure 1 a BASIC program was used to illustrate the concept of simulation, BASIC is far from the ideal language for this kind of work. Even the engineer's friend, FORTRAN, causes problems when simulations get sufficiently large and complex. Three factors should be considered when choosing a simulation language.

Programming time must be kept down. A major simulation job, such as calculating the probability of failure of a space shuttle during liftoff, could easily require many thousands of lines of BASIC. Years of programming and testing could be required, and costs could easily climb into six-figure sums.

General-purpose programming languages are designed for general-purpose use, and they produce less-than-ideal code when used for simulation. A one-year simulation of passenger traffic on Chicago's

rapid transit system (the "El"), for instance, could run for many expensive CPU hours on a 3084, IBM's largest and fastest processor. Depending on how well the source code was written, improved efficiency might cut the running time by half or more, either saving money or allowing additional simulation runs.

Probably the biggest problem with using general-purpose languages for simulations is the complexity of the resulting software. Since simulations are usually run a few times and then discarded, bugs

The biggest problem
with using
general-purpose
languages for
simulations is the
complexity of the
resulting software.

may not show up. These undiscovered bugs could have a drastic impact on a simulation's results, leading management to reach false conclusions. Simulating with a general-purpose language, therefore, tends to require extensive testing and an increased risk of error that grows exponentially along with the size of the program.

For small, simple simulations, of course, BASIC or FORTRAN can do the job. But beware—like all programming tasks, writing a simulation is usually far more complex than it first appears and, sooner or later, most programmers feel the need for something better.

For programmers who want to run simulations on an IBM PC or compatible, SLAM II, from Pritsker & Associates of West Lafayette, Indiana, may be that "something better." Figure 2 contains a rough analog of the BASIC store-clerk program from Figure 1, this time written in SLAM II. As you can see, the language

specifically adapted to the situation makes the program far simpler.

Speaking in SLAM

SLAM II is a "language" in the sense that the user writes source code, compiles it into an executable object file (called "translation" in the SLAM II manual), and then executes the object file. Unlike most other languages, however, the execution of a SLAM II program is accomplished by running SLAM II's execution program, which in turn executes the translated or compiled model and produces an output file. The output file must then be read by a third SLAM II program to produce reports.

SLAM II was originally written in 1979 by Dr. Alan Pritsker to run on an IBM mainframe. It has since been adapted to several other mainframes and minicomputers including machines from DEC, Harris, and Hewlett-Packard. It is a tribute to the PC's power that Pritsker & Associates has recently introduced a PC version.

The SLAM II language consists of two types of statements: control statements, which control the operation of the system, and network statements, which define the model. In Figure 2, the GEN, LIMITS, NETWORK, INIT, and FIN statements are control statements. The CREATE, QUEUE, ACTIVITY, TERM, and END statements are network statements. Definition of the store-clerk model required 15 statements in BASIC but only 5 in SLAM II. And the SLAM II program automatically tracks the length of the customer queue.

In addition to the control and network statements, SLAM II permits you to link user-written FORTRAN subroutines. Serious SLAM II users will need a copy of Microsoft FORTRAN, since SLAM II is limited without it. For instance, without FORTRAN, SLAM II does not support exponentiation in user calculations.

SLAM II's power is best understood by looking at both the breadth and depth of the control and network definition state-

ments. As you can see by reviewing the statements in Figures 3 and 4, SLAM II is a potent tool. But to work, it requires a programmer with a solid understanding of simulation concepts. SLAM II is not intended for casual use.

The SLAM II language seems to be an excellent and apparently bugless tool, but it could be improved with the addition of IF and GOTO statements. Although branching and even unconditional GOTOS can be configured with the ACTIVITY statement, it can take 30 minutes to figure out just how to do it and another 30 minutes to make sure that it's been done right. More explicit IF and GOTO statements would make SLAM programs more readable and would reduce the learning time for new users.

SLAM II supports a large number of built-in functions and user-callable subroutines—100 are listed in the manual. They range from the subroutine CLEAR, which clears statistical storage when called, to the function RLOGN, which returns a sample from a lognormal statistical distribution. Other functions and subroutines retrieve matrices of transaction attributes, schedule events to occur, and return utilization and availability statistics. Continuous and discrete models are also supported and can be combined in virtually any way in a single simulation.

Getting Equipped for SLAM II

Using SLAM II with the IBM PC requires a minimum of 320K RAM and one disk drive (two are highly recommended). Although there is no warning in the documentation, MS-DOS 2.0 is also required. SLAM II does not include a text editor. So unless you're willing to live with EDLIN, a separate editor is also required. And, as mentioned, Microsoft's FORTRAN is important for serious use.

SLAM II is shipped on two double-sided disks. The system consists of three programs requiring a total of 361K bytes of storage. Unfortunately, this setup means the user must do a great deal of disk swapping unless a hard disk is available,

since the entire system, coupled with the 40K bytes required by DOS, can't fit on a single disk.

This raises the question of dividing the programs into loadable modules that could be read from disk whenever needed. The problem, of course, is that disk transfer rates are slow compared to memory speeds and the improvement would be affected if too many calls were necessary. Determin-

ing whether or not the code should be modularized is, itself, a good subject for a simulation model.

The first program in SLAM II reads an ASCII source file and produces a translated version, analogous to object code. The second program reads the translated code, performs the simulation, and writes an output data file. The third program reads the output data file and prepares reports.

CONTINUOUS—SLAM II handles both discrete and continuous models. This statement declares a model to be continuous and controls several limits and variables associated such as the maximum subscript size, the maximum and minimum allowable step size, and recording frequency.

ENTRY—Places an initial transaction into either a queue or an await-node. All attributes of the initial entry can be specified.

FINISH—Marks the end of all input and starts the simulation run. Must be the last statement in an input file.

GEN—Must be the first statement in a simulation. Identifies the simulation, controls printing of the input program echo report, and specifies the number of times a model is to be run.

INITIALIZE—Specifies the beginning and ending times of a simulation and controls options for clearing statistics, initializing variables, and initializing files.

INTLC—Allows the entry of starting values for user-controlled variables.

LIMITS—Specifies required file sizes, maximum number of attributes per transaction moving through the system, and maximum total number of concurrent entries.

MONTR—Controls the trace report that monitors the progress of a simulation. Can also be used to clear statistical arrays after a "warm-up" period.

NETWORK—Must precede all network statements in an input file. Denotes

that the following statements are network statements.

PRIORITY—Establishes the sequence in which transactions leave either a queue or an await block. Priority for leaving can be either FIFO or LIFO. User-calculated priorities and tie-breakers are also supported.

RECORD—Controls the starting and ending times for the recording of data for plotting and tabulation. Also determines what data to save and how to save it.

SEEDS—Allows the user to enter random number seeds and to control reinitialization of any of the random number series.

SEVNT—Establishes threshold values for certain variables. When the variables cross these thresholds, a "state-event" occurs that can cause changes in the status of the simulation.

SIMULATE—Initiates each run and separates the control statements for each run when multiple simulation runs are being made.

STAT—Controls the collection of statistics on variables. Summary data appears on the SLAM II reports and histograms can be drawn from it.

TIMST—Initiates the collection of time-persistent statistics during the operation of a model. The data collected can be used by SLAM II to prepare histograms. Also controls cell size.

VAR—Used in conjunction with the RECORD statement to define the data to be recorded. Specifies variable names, plot symbols, labels, and so on.

Figure 3: Definitions for SLAM II Control Statements.

The translated program and the output data files are each 89,043 bytes long, regardless of the length of the source code or the complexity of the simulation. Pritsker & Associates said that the program writes files to a standard specification, regardless of model size, because the logic required to select only data to be stored would increase program size even more. The company looks forward to the

Although the lack of menus doesn't detract from the technical value of SLAM II, menus would simplify learning the system.

day when SLAM II will be able to stop and restart simulations based on the contents of these files. In the interim, however, one result of SLAM's storage strategy is that a simulation requires at least 180K bytes of disk storage space. Consequently, no more than two simulations can be stored on a single double-sided disk. If you're still using single-sided disk drives, you can forget about SLAM II. Your computer won't even be able to read the original program disk.

Although the three SLAM II programs worked flawlessly, they lack some of the polish expected from modern PC software. They don't have menus, for instance. Each program requests an input file name and an output file name. When a program finishes, the user is dropped back into DOS with no instruction as to what to do next. Although the lack of menus doesn't detract from the technical value of SLAM II, menus would simplify learning the system.

The programs are large (one is over 140K bytes), so they load slowly. And because the data files are large, they are

WIRED?



WIRELESS FILE TRANSFER.

APPLE TURNOVER™

A "wireless file transfer" package for the IBM PC® to Apple II and back, and back again. Apple Turnover is a firmware board which fits into any slot in the IBM PC® or compatible, and software running under MS-DOS®. No modems, no serial lines, no hassles, no problems. APPLE TURNOVER™ will format Apple CP/M® and Apple DOS 3.3 disks. Leave your IBM and Apple computers where they are. Simply bring your Apple disk to work and transfer your file to an IBM PC-DOS. Allows for minor modifications to text and data files. It's a simple, inexpensive, fast high performance alternative to complicated serial lines and modems.

XENO-COPY PLUS™

A "wireless file transfer" software program for your IBM PC and most PC look-a-likes. XENO-COPY PLUS™ copies files between IBM PC® and many CP/M® and foreign MS-DOS® disk formats. An uncomplicated and inexpensive way to transfer text and data files. XENO-COPY PLUS™ allows you to format, copy from and write to nearly eighty different formats. Also, allows for minor modifications to text and data files. XENO-COPY PLUS™ can be upgraded to XENO-DISK™ for the price difference.

XENO-DISK™

The high performance model of XENO-COPY PLUS™. XENO-DISK™ formats, writes to, and copies from over 100 different disk formats including 40 and 80 track 5 1/4" disks. XENO-DISK™ supports the use of several 5 1/4" disk formats. XENO-DISK™ contains a powerful table driven text translator. "Text-It™". For low volume disk production, XENO-DISK™ includes a track-by-track disk duplicator (which is faster than file by file duplication). Gives you the option to input disk format parameters which allows you to utilize uncommon disk formats. XENO-DISK™ includes a back-up disk and one free update.

80MATE™

A CP/M® 80 emulator for MS-DOS® computers. After programs have been transferred onto PC/MS-DOS® disks with XENO-COPY PLUS™, XENO-DISK™, or APPLE TURNOVER™, 80MATE™ lets you simulate most CP/M® 80 systems on your MS-DOS® computer. Includes all internal CP/M® commands and many available functions. 80MATE™ includes a terminal emulator for 7 predefined terminals including APPLE CP/M®. You can also input parameters for other terminals that need to be emulated, without additional Apple hardware.

See your dealer or
Call for information:
(213) 938-0857

Vertex
systems, inc.
Innovation in microcomputer products

6022 W. Pico Blvd., Los Angeles, CA 90035

APPLE TURNOVER, XENO-COPY PLUS, XENO-DISK, 80MATE are registered trademarks of Vertex Systems, Incorporated. IBM PC & PC-DOS is a registered trademark of International Business Machines Corporation. Apple is a registered trademark of Apple Computers Inc. MS-DOS is a registered trademark of Microsoft Corporation. CP/M is a registered trademark of Digital Research Incorporated.

Big business accounting for

IBM's new Business Management Series for Personal Computers.

IBM's Business Management Series (BMS) can improve your accounting in so many ways, they're almost uncountable.

It's derived from accounting software big IBM machines are famous for, but for not so big an investment.

(If you don't have a PC already, keep

reading. BMS is a terrific reason for buying one.)

There are six easy-to-learn programs in BMS, and they can work alone or with each other:

For example:

Inventory Accounting helps you maintain more responsive, and therefore more profitable, levels of stock by taking its information directly from....

Order Entry and Invoicing, which offers flexible methods of pricing, discounting and taxing while it helps you automatically update....

Accounts Receivable for a clear picture of your open accounts to improve



The BMS programs work alone or as a team. You can start with one, such as General Ledger or Payroll, and add others later. Or, buy all at once. If you plan to own several, consider an IBM computer



companies with smaller numbers.

cash flow and reduce bad debt.

Payroll keeps records, writes paychecks and W-2 forms, easily tackles multiple pay rates and frequencies, and much more.

Accounts Payable not only writes

checks, it helps you decide to whom and when. And, like other BMS programs, it feeds into....

General Ledger; a "big picture" program that gives you something all the green notebooks and #2 pencils in the

world never will.

The ability to see more quickly and clearly not only where you are, but where you're going.

To learn more, see an IBM Product Center or authorized IBM PC dealer.

For their number, and a free brochure, call this one—800-447-4700. (In Alaska and Hawaii, 800-447-0890.)

Accounts Payable



Accounts Receivable



Order Entry



Inventory Accounting



like the PC/XT. It lets you store them, permanently, inside your machine. Very handy. Here's another tip. IBM's new Personal Decision Series (for spreadsheets, writing, graphing, etc.) can

take information directly from BMS. Very, very handy. And ask about IBM Extended Support, a way to get software updates and telephone assistance, direct from IBM.

IBM

Personal Computer Software

CIRCLE 269 ON READER SERVICE CARD

read and written slowly. The net result is about a 15-minute turnaround to load the editor, make a revision to the source code, and then load the three programs and run them one at a time. What's more, that 15-minute turnaround excludes the time the PC actually spends simulating. A hard disk, of course, would speed operations considerably.

SLAM II's programs prevent unauthorized copying by requiring the presence of the original disk in the A: drive. This feature allows you to load programs from any drive, including a hard disk, and does not affect the making of backup copies. Although it's something of a nuisance to have to handle the original disk, there are worse copy-protection schemes.

The input program is basically a compiler. You prepare and save a source file, using any editor capable of saving files without special control characters. Then you load and run the program disk. Finally, the program requests the input file name and goes to work.

The input program is both case and column sensitive. Only uppercase letters are allowed. Furthermore, although control statements can be located anywhere on the line, network statements cannot begin in columns 1 through 6, which are reserved for labels.

Learning to Remember

In translation, each line in the input file is read and can be echoed to the screen along with error messages. Unfortunately, SLAM II is unable to output messages to disk or to a printer. The only recourse is to read quickly and remember, or to redirect the entire output of the program using DOS—which means the prompts are also redirected and you lose touch with what the program is doing. When a run is completed without errors, the program requests an output file name and writes the translated program.

Most users will quickly learn to overcome these minor shortcomings by pressing the CapsLock key before editing, and by setting a tab in column 7. They will

memorize the input prompts or move the printer to a more accessible spot. These deficiencies are mentioned only because state-of-the-art user-interfacing has gone beyond SLAM II's capabilities. The sys-

tem's limitations reflect the technical orientation of the system's designers and the mainframe, batch-oriented, FORTRAN history of the product.

When you've completed the input pro-

ACCUMULATE—Accumulates multiple transactions into a single transaction, permitting simulation of factory assembly processes and other processes that involve coordination of multiple parts, people, or transactions.

ACTIVITY—Connects a transaction with one or more resources for a period of time. Used, for instance, to cause a clerk to process an order, or can be randomly determined or fixed, and determines, either randomly or not, how the transaction flows through the network after the process is complete.

ALTER—Dynamically changes the capacity of a resource. Might, for instance, reflect the hiring of a new repairman.

ASSIGN—Assigns values to user variables that can be random, deterministic, or calculated from other variables.

AWAIT—Similar to a queue, but transactions await the availability of resources, not servers. The distinction is that resources can be held while a transaction moves through the network, while servers must be released before a transaction can proceed. And a transaction can consume more than one unit of more than one resource at any time, but can only utilize one server at a time. The await block can also delay transactions while waiting for a gate to open.

CLOSE—Causes a gate to close.

COLCT—Causes collection of statistics related either to the time of arrival of a transaction or to the value of a variable when a transaction arrives.

CREATE—Causes creation of the transactions that move through the network. Transactions can be created at random or deterministic intervals. The time of the first creation and the maximum number of transactions to be created can be specified.

DETECT—Creates a transaction whenever the value of a variable crosses a threshold. Crossing direction and a tolerance can be specified.

ENTER—Allows entry of a transaction into the network from a user-written subroutine.

EVENT—Calls a user-written subroutine when a transaction arrives.

FREE—Releases or frees resources.

GATE—Defines a gate in the network. When a gate is opened, all transactions awaiting the chance to pass through do so immediately.

GOON—Similar to a FORTRAN CONTINUE statement. Transactions simply pass through.

MATCH—Delays transactions until a matching transaction is available in one or more other queues. Similar, in a way, to the ACCUMULATE statement, but transactions are not combined.

OPEN—Causes the opening of a gate.

PREEMPT—Allows one transaction to preempt another in the use of a resource. A fire, therefore, can preempt the use of the fire trucks if they are currently a resource being used by a parade.

QUEUE—Delays transactions in a priority-driven queue until an activity is available to process them. Statistics are automatically kept.

RESOURCE—Defines a resource, and the number of them available.

SELECT—Allows a transaction to choose among several queues and the available activities based on queue and server selection rules. So, for instance, a customer arriving at the checkout area can select the shortest line.

TERMINATE—Terminates processing of a transaction removing, for instance, completed orders or satisfied customers from the simulation.

Figure 4: Definitions for SLAM II Network Statements.

cess, you can run the execution program. This program reads the translated output file created by the input program and performs the simulation. It also creates an output file to be used later by the output program.

During the operation of the execution program, SLAM II can display a trace report on-screen. The trace report is, in fact, the only indication that the PC is working. The actual simulation is performed entirely in memory, and the disk drives are silent. The trace report, in addition to indicating proper functioning, tells the user the current simulation time to give an idea of the amount of work left to be done. For large, long-running simulations, this can be very useful.

The trace report's most important function, though, is to confirm proper operation of the model. Every simulated event is in the trace report and, when studied, can reveal both logical and coding errors. One problem with this essential ingredient, however, is that it moves across the screen too fast to permit much study and can only be recorded with DOS redirection.

But in the PC implementation of SLAM II, the retention of mainframe-oriented batch characteristics is more serious. At first, you might envision SLAM II as a highly interactive simulator that would allow you to closely monitor a run, tweak variables in midstream, and modify the model during the course of a simulation. Sorry to say, SLAM II is not interactive. It does not even allow you to enter data at execution time. Any change requires re-editing and retranslation of the model.

Pritsker & Associates points out that SLAM II does accept user-written FORTRAN subroutines. Since Microsoft FORTRAN is interactive, subroutines can make a simulation interactive. The company also points out that networks can be saved separately from the edited input file, which can greatly reduce the time required to make changes and retranslate those changes.

Although I understand these arguments for why the product's batch orientation

BACKUP PROTECTED SOFTWARE WITH COPY II PC™ 2.0

COPY II PC is the backup insurance you need to protect your software investment. Voted as one of the most popular programs in PC World, **COPY II PC** makes a floppy backup of most protected software quickly and easily.

RUN PROTECTED SOFTWARE FROM YOUR HARD DISK

No longer will you have to insert your original floppy. **COPY II PC** makes using your hard disk as convenient as it should be. Works with the most popular business software. Call for current list.

Minimum Requirements: IBM PC, XT, or Compaq, 64K Memory, PC DOS (any version), One Disk Drive.

Available at your local dealer or direct from us.
Current owners may update for \$22.95 with the return of your original disk.

**CENTRAL POINT
Software, Inc.**

ONLY
\$39.95

(Plus \$3.50 Shipping & Handling)

9700 S.W. Capitol Hwy., #100, Portland, OR 97219

(503) 244-5782

WELCOME

(Prepayment Required)

Backup Utilities Also Available for:

APPLE II, MACINTOSH, and COMMODORE 64

This product is provided for the purpose of enabling you to make accurate copies only.



CIRCLE 152 ON READER SERVICE CARD

FILE TRANSFER + Conversion Utilities

APPLE	IBM PC/XT, JR.	\$129.95
TRS	Tandy 1000, 1200, 2000 ..	\$129.95
CP/M	IBM AT	\$224.95

Products For
**NEW
AT**

Transfer your Apple, TRS, CP/M to the IBM PC or Compatibles.

Transfers: (no more retyping)

- Visicalc, Multiplan
- Basic, Fortran, Cobol
- ASCII files, data files
- Word processing files

IBM PC/XT, Jr. → Tandy 2000 \$129.95
DISK Transporter transfers files back and forth, includes utilities.

New Yellow Disks
DS/DD \$2 ea. (20 min.)

New Products for IBM AT
or compatibles
Drives, 360 KB \$275.00
Prototype Boards & Extender
Cards \$120.00 ea.
Serial Cables (6ft.) \$85

■ PERSONAL
■ COMPUTER
■ PRODUCTS



1400 COLEMAN AVE., SUITE C-18 SANTA CLARA, CA 95050
TELEPHONE (408) 988-0164 PHONE ORDERS

IBM TRS 80 & TANDY, APPLE, CP/M, VISICALC, MULTIPLAN ARE RESPECTIVELY REGISTERED TRADEMARKS OF INTERNATIONAL BUSINESS MACHINES CORP., TANDY CORPORATION, APPLE COMPUTER INC., DIGITAL RESEARCH, INC., VISICORP, MICROSOFT CORP.

Dumb.



*Stand-alone programs
can't be made to work as a system
no matter how hard you might try.*

Stand-alone programs are fine. Unless, of course, you need them to work together. Because the sum of the parts will never equal a whole.

That's why even the highly touted WordStar,*

dBase II™ and 1-2-3,™ programs don't make sense as a business system.

They were designed to perform very specific application functions only, and therefore, make miserable workmates.

Fortunately, there's a smart solution. It's the new Smart Software System.

Smart's unique "modular integration" is the key to productivity. It means that The Smart Word Processor, The Smart Data Manager

Smart.



The fully integrated Smart Software System is designed to make the whole office more productive.

and The Smart Spreadsheet with Graphics not only have the uncompromising power and capacity of these leading stand-alone programs, but they also have the unprecedented capability to work brilliantly together.

So you can easily transfer data and pass commands from one to another. Which means that you can compile financial data, to be included in graph-form, within the text of a printed report, that's mailed to a list drawn

from the data manager — automatically.

Don't short change your business by attempting to squeeze the impossible out of a makeshift software system. Get Smart, and the whole office will thank you.

Smart is available for the IBM PC, PC/XT, PC/AT, and compatibles. For information call, 800-GET-SMART. (In Kansas call, 913-383-1089).

Smart Software
from Innovative Software

SLAM II

was retained, I look forward to the introduction of an interactive version.

Technical Interpretations

SLAM II's reports are complete, well formatted, and useful. For many simulations, nothing further will be required. More sophisticated reporting can be done with FORTRAN subroutines.

The standard reports are technically oriented. The state of the art has not progressed to the point where simulation is a hands-on management tool. Instead, useful simulations tend to require a professional programmer to interpret the results. The standard SLAM II reports are described in Figure 5.

Unlike its input and execution programs, SLAM II's output program is not limited to the screen. In addition to being displayed on-screen, reports can also be directed through a menu to disk. Oddly, they cannot be directed to the printer but must be copied to the printer with the DOS COPY command.

SLAM II's graphics capabilities are limited to the printing of histograms configured with asterisks and other special characters. A more powerful graphics processor would be valuable, particularly since the format of the output file is undocumented and the data cannot be directly input to an independent graphics package. Histograms, on the other hand, are better than nothing.

Big and Beefy

SLAM II's documentation arrives in a 600-page, hard-cover textbook, published by John Wiley under the title *Introduction to Simulation and SLAM II*. Professionally edited and fully typeset, this manual is a joy to behold. Looks aside, the book does a first-rate job of teaching the concepts behind simulation. The book includes brief introductions to several other main-frame simulation languages and delves into statistical theory, an important facet of most simulations. Each of the book's 14 chapters is followed by several exercises. Dozens of references are cited for further

study. And seven appendices make cross-referencing a breeze.

Despite its many positive points, however, the documentation does have its shortcomings. As is typical of language manuals, statement syntax is described with precise terms. This can create problems. For instance, the BASIC BLOAD statement format reads

```
BLOAD filespec [,offset]
```

The BASIC manual states the syntax and then defines the special terms *filespec* and *offset*. The SLAM II manual is similarly loaded with special terms. But their definitions are sometimes nearly impossible to find. For instance, the format of the RECORD control statement is explained in Chapter 10 as

```
RECORD  
(IPL0T).INDVAR, ID, ITAPE,  
P or T or B,  
DTPLT, TTSRT, TTEND, KKEVT;
```

Reference to Appendix C reveals that INDVAR can be TNOW, SS(I), DD(I), or XX(I). The index reveals that TNOW (which means the current simulation time)

is described somewhere else in Chapter 10. The amount of page flipping and reference chasing needed can be incredible. And, in this case, you are left to assume that the RECORD statement will accept the characters "TNOW" as input rather than as a literal numeric.

Searching for Answers

Even worse, there are terms in the manual that don't appear in the appendix. You have to search or guess what a "SLAM variable" is, because there is no listing under either "variable" or "SLAM variable" in the index.

Pritsker & Associates is working on a technical reference manual that it claims will solve these problems. With luck, this manual will be available by the time this issue of PC hits the stands.

A 22-page ring-bound manual covers the operational aspects of running SLAM II on the PC. *The User's Guide* is typewritten and photocopied and is adequate for its purpose. The actual running of SLAM II is relatively simple for users who understand DOS fundamentals.

SLAM II holds no on-line documenta-

ECHO—Confirms processing by the input program and reports errors discovered in the source file. Controlled by the GEN statement.

TRACE—Reports progress during the execution of a simulation and provides information required to manually trace transactions through the simulation model, validating the program. Controlled by the MONTR statement.

OBSERVATION VARIABLES—Mean, standard deviation, minimum value, maximum value, coefficient of variation, and number of observations reported for all observation variables.

TIME-PERSISTENT VARIABLES—Mean, standard deviation, minimum value, maximum value, time interval, and current value reported for all time-persistent variables.

FILE STATISTICS—Average, maxi-

mum and current length, standard deviation, and average waiting time for each file (QUEUE or Awaiting blocks use "files" to maintain lists of entries).

REGULAR ACTIVITY STATISTICS—Average, maximum and current utilization, standard deviation, and count of transactions processed.

SERVICE ACTIVITY STATISTICS—Average, maximum and current utilization, standard deviation, maximum idle time per server, maximum busy time per server, and count of transactions processed.

RESOURCE STATISTICS—Average, maximum and current utilization, standard deviation, current capacity, average, current, minimum, and maximum available.

GATE STATISTICS—Current status and percent of time open.

Figure 5: Definitions for standard SLAM II Reports.

tion. There are no help screens, and there is no tutorial. The system is delivered with several sample programs, but no narrative explains them.

Pritsker & Associates supplies a reference card outlining all statements and describing their format. Since constant cross-referencing to the manual is required to decipher special terms, the reference card will help only experienced users already familiar with the language.

An evaluation of SLAM II depends on what product you compare it with.

Pritsker & Associates have yet to formulate a firm support policy for SLAM II. It now provides 24-hour telephone assistance via a toll-free number. Support limitations may or may not become necessary as the product matures. A new version of SLAM II is now being programmed and will be offered to existing users in an upgraded version at reduced cost.

An evaluation of SLAM II depends on what product you compare it with. Most people with simulation experience work with mainframe computers. In comparison with these, the PC is very slow.

Implementation of SLAM II on the PC also isn't as polished as, for instance, Lotus's *Symphony* or even Jim Button's *PC-FILE*. SLAM II requires a technically trained user who is familiar with DOS, FORTRAN, simulations in general, and the SLAM II language. Further, the documentation is weak in some areas. SLAM II does have its compensations, though. The fact that it is also available for mainframes may add value for the person who uses it at work and has a PC at home.

Despite its shortcomings, SLAM II's implementation on the PC is technically impressive and has the potential to be a valuable management tool when applied in the right situations.

SOFTWARE ADVISOR'S

telsoft

CALL TOLL FREE

1-800 IBM ONLY

We Now Ship



- Order Line 1-800-426-6659
- Order Processing & Other Information 602-224-9345
- Order Line Hours Mon-Fri 8:30 - 5:30 Saturday 9:00 - 1:00
- Address 1943 East Indian School Road Box 194 Phoenix, Arizona 85016



- No Charge for VISA and MasterCard
- Shipping and Handling Add \$7.00 for Federal Express standard air or \$5.00 for UPS Ground to Total Order
- Personal and Company Checks Will Delay Shipping 2 weeks
- COD Orders Add 2% - \$250.00 Minimum
- Call on Purchase Order
- Prices & Availability Subject to Change Without Notice
- We Do Not Guarantee Machine Compatibility
- No returns without a return authorization number. Returns subject to a 15% restocking fee.

Framework	\$335
dBase III	\$335
Word Perfect (Ver. 4.0)	\$229

Supercalc 3 (Ver. 2)	\$175
Symphony	\$409
Lotus 1-2-3	\$289

WORD PROCESSORS	
Bank Street Writer	\$ 48
PFS: Write	79
Leading Edge Word Processor ..	58
Microsoft Spell (for Microsoft Word) ..	30
PFS: Proof	55
Microsoft Word	219
Microsoft Word w/Mouse	279
Volkswriter Deluxe	148
Word Plus Spell Checker	90
Wordstar w/Tutor	170
Wordstar Pro Pack	240
Wordstar Pro Option	115

UTILITIES	
Copy II PC	\$ 25
Desk Organizer	119
Norton Utilities 3.0	58
Prokey 3.0	75
Sidekick	32
Sidekick (Unprotected)	60
Sidekicks	35

LANGUAGES	
Basic Interpreter (Microsoft)	\$210
Basic Compiler (Microsoft)	240
Borland's Holiday Pack	65
C Compiler (Microsoft)	300
Cobol Compiler (Microsoft)	420
Concurrent PC DOS	179
Fortran Compiler (Microsoft)	210
Latex C Compiler	295
Pascal Compiler (Microsoft)	160
Macro Assembler (Microsoft)	60
Turbo Pascal	32
Turbo Tool Box	32

TRAINING	
Flight Simulator (New Version) ..	\$ 32
Jim Fix Running Program	48
Speed Reader II	45
Mastertype	35
Mind Prober	32
Typing Instructor	30
Typing Tutor II	35
Turbo Tutor	23

MONEY MANAGEMENT	
Dollars & Sense w/Forecast	\$ 99
Tobias' Managing Your Money	109
Home Accountant Plus	52
Time Advantage	39

COMMUNICATIONS	
CompuServe Starter Kit	\$ 23
Crosstalk XVI	98
PFS: Access	55

SPREADSHEETS	
Multiphan	\$115
Chart	150
PFS: Graph	78
PFS: Plan	79
PFS: Report	71

DATA BASE MANAGEMENT	
Advanced DB Master	\$348
dBase 3	249
dBase Manager II	165
KnowledgeMan	275
K-Print	60
K-Graph	105
K-Text	78
PFS: File	78
Power-Base	219
Quickcode III	149
R: Base 4350	248
R: Base Client 2	139
R: Base Extended Report Writer ..	55
Think Tank	99

PROJECT MANAGEMENT	
Harvard Project Manager	\$210
Harvard Total Project Manager ..	160
Project	160

INTEGRATIVE SOFTWARE	
Electric Desk	\$199
Enable	Call

ACCOUNTING	
BPI General Accounting	\$359
BPI Accounts Payable	359
BPI Accounts Receivable	359
BPI Payroll	359
In-House Accountant	109

Wordstar 2000 Plus	\$289
Leading Edge Nutshell ..	\$ 89
Smart Software System	\$499

Multimate (Ver. 3.3)	\$259
Energraphics	\$199
Wordstar 2000	\$239

CALL FOR A FREE SUBSCRIPTION TO THE SOFTWARE ADVISOR



DOW JONES DOES THE BOOKS

This set of accounting modules was designed to automate a small business's financial system.

Few names more readily conjure up the image of American business than Dow Jones. And the image is one of an industry giant that wouldn't use a PC for accounting chores. But, like other large publishing firms, Dow Jones saw an opportunity in the microcomputer software publishing arena. With the Dow Jones name, business software was a natural. For their first foray into the market, the company chose a set of general business packages developed by Trademark Software of Mountain View, California.

Introduced in mid-1984, the Software For Business Accounting series includes only three core modules at the time of this review—General Ledger, Accounts Payable, and Accounts Receivable. We're told that eventually seven independent modules will be available. The packages are aimed at small-business man-

Illustration: Greg Ragland

agers who want to automate their financial systems. Though Dow Jones hasn't yet supplied a solution for a business's operational systems, such as order entry and inventory, these three financial packages are some of the best available and are a serious alternative for small-business financial software.

The Dow Jones accounting software distinguishes itself with its clarity of design; the screens are clean, efficient, and easy to understand. Moreover, the transaction listings and financial reports are as well designed as any we've seen.

The software's developers worked hard to give you a flexible user interface. The system incorporates many handy facilities that make it easy to move around the various video screens, for example, to edit and scroll through your transactions. These we applaud. Unfortunately, to invoke many facilities, you must use *WordStar*-like commands (that is, use three keystrokes where one would do). To leave a function and return to a higher-level menu, for example, you must type Ctrl-KQ—as in *WordStar*. Many comparable systems simply use the escape key. Moreover, you must type Ctrl-KY to delete an account or an entry. We encountered one worrisome aspect of this interface when we inadvertently typed Ctrl-C only to have the program (indeed, the entire system) terminate abnormally. We suspect that this could be disastrous during a file update.



Software For Business Accounting

Trademark Software (A Dow Jones subsidiary)

465B Fairchild Drive
Mountain View, CA 94043
(415) 960-1800

List Price: \$750 per module

Requires: IBM PC-XT (or a PC with a compatible hard disk), 128K RAM, monitor, printer (capable of 132 columns), PC-DOS 2.x.

CIRCLE 645 ON READER SERVICE CARD

In other cases, you have the option of using a control key sequence or function key. To move one character to the left, you can type Ctrl-S or F5 or use the left arrow. Though the number of choices can be confusing at first, you should find them valuable to have once you become familiar with the system.

These accounting modules have quite a number of interesting and unique features.

Each journal has
customized
reference fields,
allowing you to tailor
the information to
each transaction's
requirements.

Therefore, we'll review only the General Ledger and Accounts Payable modules in detail. Our comments on the Accounts Receivable module, which we found as capable as the other two modules, will be brief.

General Ledger

The Dow Jones General Ledger module uses a chart of accounts coding scheme that can accommodate up to 9 alphanumeric characters—including some special characters such as periods or dashes. This coding scheme allows you to subdivide (or structure) your account numbers. Each account can be assigned a 25-character description and must be assigned to one of the following account groups: Asset, Liability, Capital, Income, or Expense.

The system has an impressive and effective feature: it allows you to define some accounts as subaccounts or subcategories. Defining your accounts this way lets you organize them and develop reporting roll-ups, which summarize your detail

accounts into higher-level accounts. To illustrate, let's assume that you want to track your telephone expenses on both a detailed and a summary basis. You could create the following accounts:

```
0705 Telephone Expense
0705.1 Basic Charge
0705.2 Long Distance-AT&T
0705.3 Long Distance-
GTE/Sprint
```

Or, if you needed to track these expenses on a departmental basis, you could set up accounts for each department:

```
0705 Telephone Expense
0705.1 Telephone Expense
(Marketing Department)
0705.11 Basic Charge
0705.12 Long Distance-
AT&T
0705.13 Long Distance-
GTE/Sprint
```

This feature has several benefits. The system automatically accumulates subaccount balances into the highest-level or parent accounts, and, when the accounts are displayed on the system's various transaction listings and financial reports, the accounts will be similarly indented for clearer reports.

Only the lowest-level balance accounts have transactions posted to them. All higher-level accounts are considered title accounts, which accumulate, and title groupings of balance accounts.

We understand from the documentation that you can establish any reasonable number of account hierarchy levels in this way. For each title account, you may enter a 25-character description to use in listing the total of subsidiary accounts. For example, you may have a title account of land but want the reported totals to be listed as Total Land/Book Value.

Your ability to establish *contra* accounts—accounts usually presented with other accounts that are opposite in sign for financial-reporting purposes—is another unique feature of this system. If you designate, for example, your accumulated

depreciation account as a contra account, you can have it print on the financial reports as a positive value—but, nonetheless, be subtracted from the appropriate asset amounts. For example, \$10,000 in office equipment less accumulated depreciation of \$4,500 equals net fixed assets of \$5,500.

Another nice convenience is account chaining, which makes it easier to enter journal transactions with multiple debit and/or credit accounts. If you enter several similar transactions, you can have the system automatically chain these accounts—display one after another as you enter each line of the journal transaction.

One powerful feature of the General Ledger module is its ability to consolidate multiple general ledgers by enabling you to establish each ledger as a "child" of another parent ledger. For each of the accounts in the subsidiary (child) ledger, you must assign a summary (parent) ledger account to post to when you consolidate your ledgers.

Consolidation is simply an interledger journal entry in which an entry is made in the summary ledger for every one of the subsidiary ledger's balance accounts. We like this feature because it allows you to consolidate entities with dissimilar charts of accounts. The number or hierarchy of possible consolidations has no practical limit. You can consolidate plant ledgers into divisional ledgers, which you can then roll up into a group ledger, and so on.

Entering Journals

With most comparable systems, you deal only with what is called a *general journal*. The Dow Jones General Ledger module goes much further—using six unique journals in which to enter your transactions. Each journal has customized reference fields, allowing you to tailor the information to each transaction's requirements. You must enter all financial transactions (journal entries) through one of the five special journals (sales, cash receipts, cash disbursements, purchases, and payroll) or the general journal. This

scheme's advantage is that each journal-entry function, which knows something about the transactions, can capture more specific and relevant reference information, which improves the audit trail immeasurably. For example, the reference field captured with each transaction varies according to the journal in use. The first reference field for each journal is

Journal	Reference field
Sales	Invoice No.
Cash Receipts	Invoice No.
Cash Disbursements	Voucher No.
Purchases	Check No.
Payroll	Employee No.
General	Reference No.

Three other such reference fields appear in each of the journals. The system automatically increments the transaction numbers listed—making the audit trail clearer.

In setting up each journal, you can establish a standard offset account, the debit or credit account that balances a journal transaction. For example, the offset account for the sales journal usually is accounts receivable; for the cash receipts journal, it's the cash account. This helps ensure your entries' accuracy and saves you keystrokes, because you don't have to enter the offsetting account each time you make an entry.

Entering your financial transactions is truly a snap. Figure 1 below shows the

HI-TECH INC. INSERT ON
Journal Entry
Nov- 2-84

Journal ID (SAL 3) Sales Journal
Offset Account (112.1) Trade

Transaction # 1 2 Invoice # 11001 Date (Dec- 5-83)
Customer (Rose Packing 3)
Sales Order # (1005) Memorandum # 1

Reg	Account	Description	Debit	Credit
1	410	Sales - Computers		4,595.00
2	411	Sales - Printers		295.00
3	412	Sales - Software		1,150.00
4	413	Sales - Misc.		75.45
5	217	Sales Taxes Payable		596.93
6	112.1	Trade	7,012.38	
6 Totals			0.00	7,012.38

Enter Customer

Figure 1: The journal entry screen as it appears when you enter sales transactions. The bottom half of this screen scrolls to accept up to 25 line items.

HI-TECH INC. INSERT ON
ENTER/MODIFY VENDOR DATA
Nov- 2-84

Vendor Name (ATLANTIC OFFICE SUPPLY 3) Vendor ID (ADR 3)

Pay to the (Atlantic Office Supply 3) Contact (Judy Crawford 3)
Order of (6459 W. McAllister St. 3) Buyer (Ron Bryant 3)
City/State (West Palm Beach 3) FL A/P Code (00) C.O.D. 3
Zip/Country (09267 3) User Codes (3)
Phone (1305) 820-9979 3 Rating (3)

Rule 1-3-5-7-9

Last Payment Date	0	Current A/P	+	0
Prior Ytd Orders	0	Period 1	+	0
Ytd Orders	0	Period 2	+	0
Ytd Discount	0	Period 3	+	0
Ytd Payments/Refunds	0	Unapplied Debit	-	0
		Total A/P	=	0

Enter Index Vendor Name

Figure 2: You can access vendor information using either the vendor name key or the more traditional vendor ID code.

Live a little.

SOFTWARE

Aptec (for color Prism Printers)	
Rainbow Writer Color Text Formatter	\$119
Rainbow Writer Screen Grabber	69
Ashon-Tate	
dBase II	255
dBase III	355
Framework	355
Friday!	169
Reference Encyclopedia (book)	55
Best Programs	
Personal Finance Programs	65
PC/Professional Finance Program II	special
PC/Fixed Asset System (version 3.0)	329
PC/Tax Cut	special
Personnel (Level 1)	279
Personnel (Level 2)	419
Personnel (Level 3)	559
Bible Research	
THE WORD (KJV Bible - 7 disks)	145
Borland International	
Sidekick	30
Sidekick (non-protected)	49
Turbo Pascal	30
Turbo 8087	59
Turbo Toolbox	30
Turbo Tutor	19
Pascal, Toolbox, & Tutor	59
Turbo 8087, Toolbox, & Tutor	85
Broderbund	
Bank Street Writer	49
Bruce & James	
WordVision	39
Continental	
Home Accountant Plus	89
The Tax Advantage	39
Financier	
Financier II	93
Financier Tax Series	109
FriendlySoft	
FriendlyWriter (with FriendlySpeller)	55
Funk Software	
Sideways	45
Harvard Software	
Harvard Project Manager	209
Harvard Total Project Manager	279
Hayes	
Smartcom II	89
Lifetree	
Volkswriter Deluxe (with TextMerge)	159
Volkswriter Scientific	289
Living Videotext	
ThinkTank	109
Lotus Development	
1-2-3	call
Symphony	call
Micro Education (MECA)	
Managing Your Money	119
Running Program (Jim Fixx)	49

PC Connection Tax Special

through March 31, 1985

BEST PROGRAMS

PC/Tax Cut

- Actually two programs in one. includes a tax preparation program as well as a tax planning program
- Program produces fully filled-out returns, ready to sign and file
- Includes extensive tax-help manual
- On-screen menus and prompts enhance ease of use
- Computes tax implications of various financial alternatives
- Program works alone or in conjunction with PC/PFP II (data is transferred directly between programs — no rekeyboarding necessary) \$123.

PC/Professional Finance Program (PFP II)

- Program is a powerful record-keeping and accounting system
- Capable of generating budget forecasts, producing sophisticated reports and, of course, writing your checks and balancing your "check-book"
- Characteristic of Best Programs, PFP II is easy to use, with features such as: 16 transactions can be displayed on the screen at one time, "autoentry" feature which runs repetitive transactions with keystroke, checkbook-style data entry, on-screen calculator, and built-in running total function 143

PC/Tax Cut and PFP II

Micropro	
WordStar	\$179
WordStar 2000	259
WordStar 2000 Plus	299
Microlim	
RBase 4000	259
Extended Report Writer	85
Clout II	135
Microsoft	
Multipan (version 1.2)	125
Microsoft Spell	35
Microsoft Word (version 1.15)	239
Microsoft Word with mouse (ver 1.15)	289
Microsoft Mouse with software	135
Microsoft Serial Mouse with software	135
Microsoft Project	155
Microsoft Chart	155
Microsoft	
Crosstalk XVI	99

Infoscope	\$149
Transporter (includes Crosstalk)	169
Multimate International	
Multimate (version 3.3)	259
PCsoftware	
PCcrayon II	39
Executive Picture Show	139
CREATBASE	47
Peter Norton	
Norton Utilities (version 3.0)	65
Rossoft	
Prokey 3.0	89
Satellite Software	
WordPerfect (version 4.0)	249
Software Arts	
TKISolver	249
Software Publishing	
PFS:Access	59
PFS:File	85
PFS:Graph	85
PFS:Plan	85
PFS:Proof	59
PFS:Report	77
PFS:Write	85
Sorcim	
Supercalc 3	199
Virtual Combinatics	
Micro Cookbook	29
Warner Software	
The Desk Organizer	139

TRAINING

ATI

SKILL BUILDER PROGRAMS

Intro To:

Word Processing	Accounting
Business Software	Data Bases
	each 32

How to Use:

Compaq	MS-DOS (2.0)
CPM-86	PC-DOS (2.1)
PC-Basic	Home Accountant
IBM-PC	VW Deluxe
	each 32

TRAINING POWER PROGRAMS

How to Use:

dBase II	dBase III	Lotus 1-2-3
MS Word	Easywriter II	Multimate
Multipan	Supercalc 3	Framework
Symphony	Wordstar	TKISolver
		each 49

Comprehensive Software

Intro to Personal Computing	39
Intro to Databases	39
Intro to Communications	39
Intro to the Operating System (PC Tutor)	39
Individual Software	
The Instructor	35
Professor DOS	47
Tutorial Set (both items above)	75

* DEFECTIVE SOFTWARE REPLACED IMMEDIATELY. DEFECTIVE HARDWARE REPLACED OR REPAIRED AT OUR DISCRETION. SOME ITEMS HAVE WARRANTIES UP TO FIVE YEARS.
© COPYRIGHT MICRO CONNECTION, INC. 1984. ALL ITEMS SUBJECT TO AVAILABILITY. PRICES SUBJECT TO CHANGE WITHOUT NOTICE. IBM IS A REGISTERED TRADEMARK OF IBM CORP.
J. CONNECTION AND MICRO CONNECTION ARE TRADEMARKS, AND PC CONNECTION IS A REGISTERED TRADEMARK OF MICRO CONNECTION, INC. MARLOW, NH.

PC CONNECTION®



PC Patisserie.

Rise to the top.

Many people find it hard to believe that the world's most respected name in IBM-PC additions and software could be located in the primeval forest of Marlow, NH (pop. 545). Can a rural company really offer all the essential ingredients of a high powered microcomputing environment? You know—jogging trails, two hour lunches, free tickets to rock concerts, croissants, baklava, and scones?

Well, we don't think you have to be flaky to make a lot of dough. And even PC Connection's hard working sales consultants need their just desserts. So they asked our hair-brained (and footed) mascots to get cooking. We hope the profits won't all go to waist.

Sweet surrender.

If you're looking for a taste of humanity in the microcomputer zoo, you just found it. We'll help you decide which word processing program is right for you; how much memory you need to run that sweet little

integrated package; or which printer will give you the quality you need at a price you can afford.

Because no one ever walks away from our 800 number still hungry.

Icing on the cake.

Picture this. It's 3 A.M. You've been staring at that screen for six hours. You need to take a break, whip up a cupcake or five. But what will you wear? Don't despair! Tie on your PC Connection apron and turn up the heat. These aprons feature our light and fluffy mascot, and are free to anyone who places a \$500 order between now and May 30. Don't thank us. It's the yeast we could do.

Just call 1-800/243-8088 or 1-603/446-3383 anytime Monday through Friday 9:00 to 9:00, and Saturday to 5:30. If you're planning to visit, call ahead to make sure what you want is in stock. The showroom closes at 8:00 M-F and at 5:00 on Saturday.



The PC Connection apron. A stunning combination of haute cuisine, haute couture, and haute tech. One per customer. Not available to commercial accounts.

For the IBM-PC (XT & AT) exclusively.

PC CONNECTION

Save a lot.

AD-2 Adapter for Portables	\$15	Pinwriter P3(IBM) 132 column	\$897	Multiplan (Microsoft)	dBase III
System Stand	19	Sprinwriter 2050 (3550's little brother)	699	Peachtext 5000	Framework
CABLES		Sprinwriter 3550 (IBM-PC compatible)	1389	Easywriter II	Multimate
Extension Cables for IBM Mono Display	35	Sprinwriter 8550 (IBM-PC compatible)	1789	Volkswriter Deluxe	each 12.
Keyboard Extension Cable (3 to 9 feet)	27	Orchid Technologies		WICO	
AC Plug Adapter (any monitor to your PC) &	8	All Orchid Boards come with PCNet Drive		Joystick	35
SURGE SUPPRESSORS		(Ram disk), PCNet spool (print spooling),		DRIVES	
Diamond (switched 6 outlets)	33	disk caching & partitioning		All drives are completely pre-tested and are	
Emerald (switched 6 outlets; 6 ft cord)	43	Blossom 64k upgradeable to 384k,		supplied with a printout of the test results.	
Sapphire (switched 3 outlets;		with clock calendar, serial and		Comes with complete step by step installation	
EMI/RFI filtered)	53	parallel ports	229	instructions. Drives are 320k/360k	
Ruby (switched 6 outlets; EMI/RFI filtered,		PCNet Daughtier Board (piggybacks to		Tandon	
6 ft cord)	63.	Blossom) with version 2.4 networking		TM 100-2 (5 1/4") full-height drive (DS,DD)	
Epson		software	call	see special	
Many of the RX, FX, and JX dot matrix printers		PCNet Blossom 64k Blossom Board with		TEAC	
are now being shipped as the "Plus" version.		the Daughtier Board installed	call	FD-55B (5 1/4") half-height drive (DS,DD)	
"Plus" printers can print in near letter quality		PC Turbo 128k	call		119
(NLQ) with the addition of the NLQ option		Paradise Systems		Free Y cable & bracket with each pair	
RX-80 with GRAFTRAX-Plus	call	Modular Graphics Card	275	MEMORY	
RX-80 FIT with GRAFTRAX-Plus	call	Multidisplay Card	289	64k Memory Upgrade Set for IBM-PC	
FX-80 with GRAFTRAX-Plus	call	Princeton Graphics		or XT system board	27.
RX-100 with GRAFTRAX-Plus	call	HX-12 RGB monitor (690 x 240)	call	64k Memory Upgrade Set for any memory	
FX-100 with GRAFTRAX-Plus	call	MAX-12 Amber monochrome monitor	call	board specify make of board	27.
JX-80 with GRAFTRAX-Plus	call	Quadram		Install memory upgrades & run diagnostics	10.
LQ-1500 (letter quality dot matrix)	call	New Expanded Quadboard 64k		at time of board purchase only	
Printer to IBM Cable (specify printer)	27	expandable to 384k, with clock calendar,		DISKS	
FTG Data		parallel, serial & game port, I/O bracket,		Verbatim (with 5 year guarantee)	
Light Pen (Push Tip)	195	and Quadmaster software	249	Datallite Disks SS/DD plastic box of 10	21.
Demo Disk Set for Light Pen	39.	Microfazer Printer Buffer (parallel) w/copy		Datallite Disks DS/DD plastic box of 10	29
Hayes		MP 64 (64k) upgradeable to 512k	169	Disk Drive Analyzer	19
Smartmodem 300	199	Quadcolor I	197	Flop Sort (holds 75 disks)	19
Smartmodem 1200	459	Quadlink	369		
Smartmodem 1200B (w/Smartcom II)	389	Quadchrome RGB Monitor	469		
Smartmodem 2400	597	Quadchrome II	469		
Smartcom II	89	SMA (Systems Management)			
CompuCable's		PC-Document Keyboard Templates			
Smartmodem-to-IBM Cable	25	available for:		INFORMATION SERVICES	
Hercules Computer		DOS/Basic 1.1	Supercalc 3	Compuserve	
Hercules Graphics Card (parallel port)	309	DOS/Basic 2.0-2.1	Wordstar	Compuserve Information Service	
Hercules Color Card (parallel port)	169	Lotus 1-2-3	Turbo Pascal	(includes subscription, manual, 5 hours of	
Graph-X Software	42	Symphony	WordPerfect	connect time, monthly publications)	25
IOmega		Multiplan (IBM)	dBase II	Source Telecomputing	
Bermouli Box 20 Meg	2695			The Source (subscription & manual)	39
10 Meg cartridge	56				
key tricnic					
Deluxe keyboard (KB 5151)	169.				
Koala					
Koala Touch Tablet with software					
(connects to game port)	89				
Speed Key System	115				
Kraft					
Joystick	35				
Maynard Electronics					
Floppy Drive Controller	119				
Internal Hard Disk (10 Meg) with					
WS-1 Controller	859				
Internal Hard Disk (10 Meg) with					
WS-2 Controller	1049.				
Mouse Systems					
PC Mouse (w/software & desk pad)	129				
PC Mouse (w/software, pad, & PC Paint)	139				
PC Paint (software)	69				
NEC					
Pinwriter P2(IBM) 80 column	679				

FINANCIER jr. for \$19!

It looks like a lot of you got an IBM-PCjr for Christmas. It's a great deal at the price, and all of the new add-ons and software coming on the market make IBM's little big man even more attractive.

To celebrate, JR. CONNECTION is offering FINANCIER jr., a complete home finance program, for \$19.00.

We've been in the junior business from

the beginning. We have a staff of trained consultants who work exclusively with the PCjr. They've studied the market and the machine and know what's available and how to make it work for you. Disk drives, monitors, keyboard, memory upgrades, and all kinds of software. Just call 1-800/IBM-jrPC or 603/446-7761. We have the answers, the products, and the prices.

1-800/IBM-jr PC

CIRCLE 339 ON READER SERVICE CARD

PC CONNECTION®

Folded edge of the page



GeoSlipSheet-001

Inverted Foldout slip-sheet

Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



1. Follow instructions on the other side

Inverted Back



Gbe5ipBack-0018

Back

1. Follow instructions on the other side

Learn a little.

Professor Pixel	\$47
Typing Instructor	39
LEARN - PC Video	
Introductory to Lotus 1-2-3 (videocassette training) specify VHS or BETA	call
Scarborough Systems	
Master Type	35

EDUCATIONAL

Davidson	
Speed Reader II (high school & college)	49
Math Blaster (grades 1-6)	35
Word Attack (grades 4-12)	35
Spell II (grades 5-adult)	35
Additional Data Disks for other ages are available for Speed Reader II and Word Attack at \$15. each	

Digital Research	
Diagnostic Test (PSAT)	14
OwlCat SAT (15 hour)	63
OwlCat SAT (60 hour)	169

FriendlySoft	
FriendlyWare/PC Introductory Set	35

Spinnaker	
Educational Games for Young Computer Users. (All require graphics board)	
Delta Drawing (ages 4 to adult)	34
Snooper Troops I (ages 10 to adult)	30
Snooper Troops II (ages 10 to adult)	30
Most Amazing Thing (ages 10 & up)	27
President's Choice (ages 13-adult)	27
Face Maker (ages 3 to 8)	23
Kids on Keys (ages 3 to 9)	23
Story Machine (ages 5 to 9)	23
Fraction Fever (ages 7 to adult)	23
Kinder Comp (ages 3 to 8)	20
Rhymes and Riddles (ages 5 to 9)	20
Hey Diddle Diddle (ages 3 to 10)	20
Alphabet Zoo (ages 3 to 8)	20

Stone (requires graphics board)	
My Letters, Numbers, Words (ages 1 to 5)	29
Kids Stuff (ages 3 to 8)	29
Across the U.S.A. (ages 5 and up)	22

GAMES

Blue Chip	
Millionaire	39
Tycoon	39
Baron	39
Broderbund	
Lode Runner	25
FriendlySoft	
FriendlyWare/PC Arcade	35
Hayden Software	
Sargon III	35
Infocom Difficulty levels shown in italics	
SeaTalker (junior)	25
Zork I (standard)	25
Enchanter (standard)	25
the Witness (standard)	25
Planetfall (standard)	25
Cuthroat (standard)	25
Hitchhiker's Guide (standard)	25
Zork II (advanced)	29
Zork III (advanced)	29

PC Connection Hardware Special

through March 31, 1985

Tandon

TM 100-2 Disk Drive (DS/DD)

- Formats 320k under DOS 1.1, formats 360k under DOS 2.0, 2.1, or 3.0
- Every disk drive is pretested and shipped with the printout of test results
- Each drive supplied with complete step-by-step installation instructions and mounting screws

NEW low price \$109

OUR POLICY

- We accept VISA and MASTERCARD
- No surcharge added for charge cards
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order
- No sales tax.
- All shipments insured; no additional charge
- Allow 1 week for personal and company checks to clear
- COD max. \$1000. Cash or certified check
- 120 day guarantee on all products *
- To order, call us anytime Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30. You can call our business offices at 603/446-3383 Monday thru Friday 9:00 to 5:30.

SHIPPING

Continental US: For monitors, printers, and drives, add 2% to all orders. For all other items, add \$2 per order for UPS surface, \$3 per order for UPS 2nd-Day-Air. We particularly recommend 2nd-Day-Air if you live west of the Mississippi or south of Virginia. In most cases it will only cost \$1 more and will save you up to four days on delivery time. **Hawaii:** For monitors, printers, and drives, actual UPS Blue charge will be added. For all other items, add \$3 per order. **Alaska and Outside Continental US:** Call 603/446-3383 for information.

1-800/243-8088

PC Connection 370M
6 Mill St., Marlow, NH 03456
603/446-3383

Inidel (advanced)	\$29
Sorcerer (advanced)	29
Suspect (expert)	33
Deadline (expert)	33
Starcross (expert)	33
Suspended (expert)	33
Invisucos (hint booklets) are available for all Infocom games. Specify game	
7.	
Microsoft	
Flight Simulator	35
Origin Systems	
Ultima III	39
Orion	
J-Bird (you'll never sleep)	29
PC-Man.	25
PCSoftware	
Amchar Quarterback	27
Chess 2001	27
Championship Blackjack	23
Professional Software	
Trivia Fever	23
Sir-Tech	
Wizardry	42
Spectrum Holobyte	
GATO	27
Sublogic	
Night Mission Pinball	29

HARDWARE

AST Research (For IBM-PC or XT)	
All AST Boards come with SuperDrive, SuperSpool, and one year warranty	
SixPakPlus 64k upgradeable to 384k, with clock calendar, serial and parallel ports (game port optional)	249
MegaPlus II 64k upgradeable to 256k (or more with MegaPak) with clock calendar and serial port (parallel, game, or second serial port optional)	249
MegaPak 128k (not upgradeable)	239
MegaPak 256k	339
I/O Plus II with clock calendar and serial port (parallel, game, or second serial port optional)	
129	
Parallel, Game, or second Serial Port for any AST board (specify board)	
35	
Connectal connector bracket (PC only)	
19	
AST-5251	
529	
AST-3790	
589	
Amdek	
Video 300G monitor (green)	139
Video 300A monitor (amber)	149
Video 310A monitor (amber)	179
CompuCase	
Plastic Keyboard & Drive Cover Set	17
IBM Mono Screen Enhancement	17
Printer to IBM Cable (specify printer)	27
Smartmodem to IBM Cable	25
Cuesta Systems	
Datasaver (200w power back up)	call
Curtis	
STANDS	
PC Pedestal (for IBM Mono or Color)	37
PGS or Quadchrome Adapter for above	9
Low Profile Tilt and Swivel Pedestal	37

For the IBM-PC Exclusively.

PC CONNECTION®

screen used to capture journal entries—in this case, the sales journal. After you've entered the reference data for a given journal entry, you can enter up to 25 individual line-item debits or credits. You enter these journal line items into the lower section of the screen, which is, in effect, a scrolling window. This window can display up to 7 line items, after which it scrolls to accept more items.

The module uses a unique (and we think outstanding) method of reporting the status of the financial transactions that you've entered. Upon entry, a transaction is considered unposted. Transactions remain unposted until you decide to post them, as in most comparable systems. The Dow Jones system, however, lets you post transactions in one of two ways. You may first pencil post them. Pencil-posted transactions are simply legitimate financial transactions that have been posted to the accounts (and thus affect your financial reports), but you can change them. You can modify or delete pencil-posted transactions and then produce revised financial statements. When you're satisfied with the accuracy of the pencil-posted transactions, you can ink-post them—after which you can't change them.

The general journal proof listing reports your journal transactions effectively, separating prior transactions from current transactions, which are unposted, pencil-posted, or ink-posted. Just as important, when you produce a financial report that is affected by pencil-posted transactions, its special status is reported on the bottom of each page.

You can enter 12 individual monthly budget figures for each balance account. The budgeting feature ultimately enables you to print an income statement/budget report, which lists for each account, the current period balance, the budgeted amount, and the dollar and the percentage variance from budget. This gives you a capable budgeting facility. However, we believe that the General Ledger module could be improved by letting you budget at the summary (or title) account level—be-

cause budgeting at the detail account level is often unnecessary, if not impossible.

General Ledger Module Reporting

The system has no financial report writer per se, but it allows you to customize your reporting formats through the account-hierarchy feature discussed earlier. By structuring your chart of accounts appropriately, you can make the system's standard financial reports clearer and more effective. Standard financial reports include a detail and summary balance sheet and income statement, several income analysis statements (income versus budget, income versus last period, and so on), as well as a single special (user-defined) balance sheet and a single special-income statement.

Your only latitude in setting up the two special reports is to specify for each account whether the account is to appear

One distinctive feature is the use of the vendor ID code and the vendor name as "keys" to index the vendor master file.

on the special report. You can select title or balance accounts. For some account series, you may wish to list the accounts in detail; for other accounts, you may want to see only summary balances.

The system offers some limited flexibility in creating your financial reports. For example, you can specify for each financial account whether it should appear at the top of a new page on each of your special, summary, and detail reports. Further, when printing a report, you can specify a report title, special page length, and

whether to pause during printing to accommodate single-sheet paper. And finally, you can apply a scale factor to all financial data that ranges from whole dollars to millions of dollars.

Also, you can compress wide reports for a narrow-matrix printer. The house-keeping routines include a function that allows you to establish the escape sequence that your printer uses to switch to compressed print.

Accounts Payable

The Dow Jones Accounts Payable module is consistent with the General Ledger module and supplies a well-thought-out means of automating the traditional accounts payable function for a typical small business. With this module, you can establish and maintain a vendor database as shown in Figure 2, enter vouchers and debit memos, select vouchers for payment, write or void checks, post entries from handwritten checks, enter refunds and other adjustments, and print a variety of reports to manage payables to vendors more effectively. Like the General Ledger module, the Accounts Payable screens and reports are intuitive and well organized, and the reports provide for an effective audit trail—as good as any comparable system we've seen.

You may have noticed the reference to vouchers instead of vendor invoices because the Dow Jones Accounts Payable module employs a voucher-numbering scheme. A voucher represents an obligation of funds most often associated with payment due for goods or services. The system gives each obligation (voucher) a sequential voucher number as shown in Figure 3. In most cases, a single vendor invoice number is associated with each voucher. But this isn't necessary. Some small vendors don't use invoice numbers, or you can use the voucher to record an obligation due an employee. The use of voucher numbers, instead of simply using vendor invoice numbers, helps you control the payables and maintain an adequate audit trail.

One distinctive feature is the use of the vendor ID code (up to 8 characters) and the vendor name (up to 25 characters) as "keys" to index the vendor master file. That is, in using the system, you may reference or call up a vendor by using a traditional vendor code or by simply using the vendor's name. In entering vouchers, for example, you needn't remember every vendor's ID code. You can simply type in the vendor's name key to assign an obligation to the appropriate vendor. In fact, if you aren't sure how to spell the established name key, you can enter just the first few characters. The system then displays the first vendor that matches these characters. You can then scroll (backward or forward) through your vendor records to the appropriate vendor.

Another distinguishing feature of the Accounts Payable module is how you can select, sort, and report your vendor records. You can request a printout of all vendors meeting up to four different criteria based on up to 26 different items of information on each vendor. These criteria can involve comparisons in which you can use wild cards (* and ?), as in PC-DOS) in specifying your comparison values. For example, if you want to include in a particular vendor list all vendors with names that begin with McC, your comparison value for use in matching the vendor name field would be McC*. You can also specify that the report be sorted on up to 4 fields from among the 26 different data fields that are associated with the selected vendors.

Payment Selection

The system has a sophisticated payment selection process—beyond simply selecting those vouchers/invoices due on a given date. Using a selection feature much like the one described for developing selective vendor listings, you can use the voucher selection criteria function to establish payment selection criteria based on a wide variety of voucher or vendor fields. Figure 4 shows the use of this function. As you can see, you can set up multiple criteria.

```

HI-TECH INC.
ENTER/MODIFY VOUCHERS

Voucher No 00010303          P/O No 0000303          Date 0ct-5-84
Vendor Name EDIARD, INC.          1          Vendor ID EDIARD 1
Terms Code 2 3 25 10 NET 30

Vendor Invoice No 10-473482433 3      Memorandum          1
Invoice Amount 0 33.983          Invoice Date          1
Discount Amount 0 1.103          Discount Date        1
Net Amount 0 33.982          Due Date              1

# Account Description Amount
1 650 Office Supplies 55.08

1<- Total Lines Balance * 0.00

Voucher Number

```

Figure 3: The screen with which you enter or modify all vouchers. Unique voucher numbers control all obligations.

HI-TECH INC.					INSERT ON
VOUCHER SELECTION CRITERIA					
Nov= 2-84					
Group And/Or	Field	Field And/Or	OP	Comparison Value	Field Description
A	(25)	(3	[>]	(0)	15 User Codes
		(3	[(16 Rating
					17 Prior Ytd Ord.
					18 Ytd Orders
B (AND)	(1)	(AND)	[>=] [C=		19 Ytd Discount
			[<=] [H=		20 Ytd Pay/Ref
					21 Total A/P
C ()	()	(22 Current A/P
		()	(23 Period 1
		()	(24 Period 2
		()	(25 Period 3
D ()	()	(26 Unapplied Debit
		()	(27 Last Paymt Date
		()	(28 Invoice Date

AND = select if both expressions must be met, OR = if only one must be met

Figure 4: With this voucher selection screen, you can be highly selective in deciding which vouchers checks should be prepared. Notice the one-line help message at the bottom of the screen. The message displayed always relates to the field occupied by the cursor. The Dow Jones software uses this helpful technique throughout.

You can use only a single condition as the basis for selection.

For example, you want to select all vouchers for which there is an available discount. To do so, you specify that field 32 (available discount) be greater than zero. Or you want to establish two or more conditions. The payment selection criteria specified in Figure 4 call for the selection of only those vouchers in aging group 3 (field 25 > 0) with names beginning with letters C through N.

Having run the automatic voucher selection function, you are then able to use

the manual voucher selection function to authorize payment of additional vouchers or to modify payment authorizations made with the automatic function. The software includes a rather elaborate and sophisticated payment selection facility that the majority of users may not need. That the majority won't tap this facility is probably unimportant. Rather, the few users who need it now have an alternative.

You can establish multiple bank accounts in preparing checks. For each account, you establish a two-character code and a description. You must also

specify the general ledger account it is associated with (presumably one of the cash accounts). When printing checks, you then indicate the bank account the checks are to be recorded against, a handy feature for those who maintain multiple bank accounts.

Once they're printed, the system maintains the information about your checks, which makes voiding checks easier. When you void a check, the system automatically reinstates the obligation for the voided payment. Checks not voided can be cleared. You can print a check status report that summarizes the status of all checks (as voided, cleared, or outstanding). This function, of course, helps in reconciling your bank account.

This module supplies the usual complement of accounts payable reports, including the selective vendor listings, a voucher proof listing and register, a detailed and a summary aging, a cash requirements summary for a review selected payments before printing checks), and check registers for both automated and manual checks.

The Accounts Receivable module is consistent with the General Ledger and Accounts Payable modules discussed earlier, and we won't review its capabilities in detail. Note, however, that it gives you more than simply the processing of amounts your customers owe you. Along with the usual accounts receivable chores, the module has complete customer invoicing, including maintaining a file of inventory items to make customer invoicing easier. The module's invoicing routines allow you to establish up to 26 different quantity/price break schedules to use in pricing your merchandise, and the system provides for customer's having multiple "ship to" addresses. Obviously, this module is more than a simple accounts receivable system.

Passwords, Training, and Technical Support

All three modules use a password protection scheme that allows you to set up unique passwords for each user. Individu-

als are denied access to the entire system unless their password matches their user identification.

Though this accounting software is fairly easy to use, Dow Jones, recognizing the value of proper training and support, has developed a seminar on the system's implementation and use. For \$500 a day, Trademark Software conducts the seminars at your offices.

A toll-free technical support line is available to all registered owners for hot-line help with the software. This service is free for the first 90 days; after that you pay \$200 for an additional year and \$100 for every year thereafter.

The Dow Jones system lacks a way to set up recurring vendor payments or journal entries, a feature most businesses can use.

The Dow Jones documentation ranks among the best in the industry. A standard three-ring binder with a slipcover case documents each module. The documentation is well organized and indexed; it uses different type fonts to highlight items and has plenty of sample screens to illustrate data. One appendix addresses error messages in detail. Another appendix contains a set of handy worksheets (forms) to use in organizing your data when you initialize your ledger.

What's Missing?

These packages contain many useful features for the money, but they lack several important elements that could make them more effective. The system supplies

little, for example, for a custom report writer. Some comparable systems allow you to define as many custom reports as you like and give you more latitude on the contents than in the Dow Jones "special" reports. We believe, however, that the clarity and the breadth of the Dow Jones's standard reports somewhat mitigates this omission.

The Dow Jones system lacks a way to set up recurring vendor payments or recurring (often called *standard*) journal entries, a feature that most businesses can use. You also can't specify that a given journal entry is to be reversed automatically in the subsequent period.

The system uses no accounting calendar per se. Though you can specify a transaction number to "cut off" the current month (enabling you to enter next month's transactions before closing the current month), you can do this for only a single month. Some companies may find it necessary to keep open more than one prior month.

Finally, when we reviewed the packages, we couldn't export the financial data in the system to a spreadsheet or database, for example. Many of our clients want to perform special analyses using their financial information, and this would lessen the need for a custom report writer. Trademark Software representatives told us that this "export" facility was on its way and could be available as you read this review. Check with your dealer.

Conclusion

The Dow Jones accounting modules reviewed here are the beginnings of a solid, well-organized, and easy-to-use accounting series. Though they lack a custom report writer—something comparable high-function PC-based accounting systems have—the modules also incorporate several unique features that make the software a must-examine alternative if you or your organization can do without designing custom reports. It will be interesting to see the complete series.—G. William Dauphinals and Michael A. Yesko.

WE TURN YOUR PC INTO A GRAPHICS TERMINAL WITH VTERM/4010



The original VT100 terminal emulator for the IBM PC has something new under the hood: Tektronix 4010/4014 emulation. Now you can use one powerful, well-built software package for mainframe graphics, terminal emulation and file transfer.

VTERM/4010 gives you all of the features of VTERM II, plus Tektronix graphics. It can run mainframe graphics applications from SAS, ISSCO, Tektronix (PLOT 10), Precision Visuals, and many other similar packages. And VTERM/4010 will save pictures on disk, or draw them on Hewlett-Packard and IBM plotters.

But that's not all. As thousands of users know, the VTERM communications line comes standard with these exceptional features:

- Complete VT100, VT101 and VT102 emulation.
- Full throughput to 9600 baud.
- A highly reliable error-free file transfer with CRC checking, including complete host software for several host operating systems.

- XMODEM file transfer also supported.
- An ASCII file transfer system with a wide variety of options that allow exchanges with most host systems using only standard host utilities.
- Optional 132 column display using a special display adapter available from Coefficient.
- Autodialing, on line help, and a unique softkey command system that lets you automate many communications functions.
- Easy-to-use setup screens always accessible with a single keystroke.
- Multiple setup files.
- A "hot-key," that lets you switch instantly back and forth between DOS and VTERM without ever losing your terminal screen or communications link.

Get the picture? VTERM II gives you DEC terminal emulation, file transfer and lots more. VTERM/4010 gives you all that plus Tektronix graphics.

Call Coefficient or your local dealer today.

Coefficient Systems Corporation (212) 777-6707 611 Broadway, New York, N.Y. 10012

At two o'clock in the morning, when most of the country's asleep, and the phone rates have gone down, my computer is talking to our offices all over the country ... all by itself.

With Transporter, my computer can send and receive files — anything from documents to BASIC programs to VisiCalc reports — late at night, after I've gone home for the day, and after long distance rates have gone down. That saves me time and money.

It does all that without anyone here to help it. I just make up a list of things for it to do, and go home. Transporter does all the rest. It "wakes up" at the appropriate time, dials up other CROSSTALK or TRANSPORTER systems, and transfers the files I want. It can even dial up a remote printer, and print files for me. And it does it all with complete accuracy. When I come in the next morning, Transporter gives me a report of what it did, and at what time it did it.

I like it because it frees up my time during the day. The boss likes it because it saves on our phone bill. (The cleaning ladies are still trying to figure it out.)

Transporter — an exciting new idea in microcomputer communications from Microstuf, the creators of CROSSTALK. Ask your local dealer about it.

1000 Holcomb Woods Parkway / Roswell, Georgia 30076

MICROSTUFTM

For the IBM personal computer. Requires 96K RAM, two disk drives, PC-DOS, Hayes Microcomputer Products Stack Smartmodem or Smartmodem 1200, IBM Asynchronous communications interface, or equivalent RS232 interface. Communicates with any system running CROSSTALK, TRANSPORTER, or other compatible programs.

Transporter, Crosstalk and Microstuf are Trademarks of Microstuf, Inc. VisiCalc is a Trademark of VisiCorp. Stack Smartmodem and Smartmodem 1200 are Trademarks of Hayes Microcomputer Products, Inc.



TRANSPORTERTM

CIRCLE 333 ON READER SERVICE CARD

Speed Through The Reading Barrier

You can double or triple your reading speed and increase your comprehension, if you let your PC be your drill master.

With the right exercise regimen, practiced regularly, you can train yourself to run faster and tire less easily. Speed-reading teachers say that the same is true for reading. With the right training, the right exercises, and lots of practice, you can read at double or even triple your current speed without sacrificing comprehension.

Here's a trio of software packages for your PC that are designed to get you going on your own speed-reading exercise program.

■ The Evelyn Wood Dynamic Reader

What Xerox is to copying and Kleenex is to tissues, Evelyn Wood Reading Dynamics is to speed reading. Evelyn Wood, a one-time remedial-reading teacher from Salt Lake City, practically invented the concept of speed reading in the 1960s, and the company she founded, Evelyn Wood Reading Dynamics, Inc., says that, in the years since, it has taught her speed-reading method to some 2 million students.

If you want to take an Evelyn Wood course from a live instructor, you can expect to pay in the neighborhood of \$500 for 18 hours of classroom instruction. A cheaper alternative is to pay \$200 for a less-comprehensive course on audio-cassette tapes. And now, for \$89.95 you can buy *The Evelyn Wood Dynamic Reader*, a program that will teach you the basics of speed reading, Evelyn Wood-style, with the help of your PC. It won't teach you everything you'd learn in the classroom-based course, or even in the audio course (Evelyn Wood isn't going to undercut its other product lines), but it does present the fundamentals of the Evelyn Wood method at a price competitive with that of other speed-reading software.

The course focuses on two key Evelyn Wood techniques: increasing reading speed by using your hand to guide your eye across the text and increasing comprehension by constructing a "recall pattern" of the content of the text. The *Dynamic*



SPEED READING

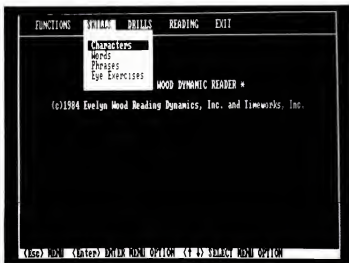


Figure 1: A pull-down skills menu from The Evelyn Wood Dynamic Reader.

Reader manual explains how to use these techniques and gives other tips on increasing both reading speed and comprehension. The software provides the drills and exercises to make the techniques second nature. It also keeps a record of your performance and, on demand, will produce a written report or a graph showing your progress.

Written for Evelyn Wood by Timeworks of Chicago, the program borrows a bit from Apple's Macintosh by using "pull-down menus" for each of its main functions. In the absence of a mouse, you use the PC's arrow keys to move the cursor across the top of the screen to highlight

a menu title. When you want to "pull down" a menu, you hit the Enter key. An example of a pull-down menu is shown in Figure 1.

This is an efficient design that makes the mechanics of the program easy to master. Unfortunately, Timeworks chose to slow things down a bit by having you confirm many of your commands with an extra keystroke, as in "Do you really want to open a file? (Y/N)". Another annoyance is the program's insistence that you remember to open a data file each time you begin a lesson. This could easily have been accomplished automatically to relieve the student of a boring housekeeping chore.

The program comes on two copy-protected disks. Setup requires the familiar transfer of the DOS programs to make the *Dynamic Reader* program disk self-booting. You'll also need a blank data disk, on which *The Dynamic Reader* will keep track of your progress.

Before you start practicing speed-reading techniques, *The Dynamic Reader* asks you to measure your initial reading speed and comprehension. You read a selection

from the supplemental booklet that comes with the program, pressing function keys when you start and finish. This enables the program to calculate your reading speed. It then asks a series of questions to measure your comprehension of the selection. *The Dynamic Reader* stores the results of these first tests; on request, it shows you a scorecard (see Figure 2).

Using this scorecard, you can set your reading speed and comprehension goals. The manual recommends that you choose a date 6 to 8 weeks in the future as your "goal date" and set a reasonable "goal speed," say from 2 to 2½ times your initial reading speed. To achieve these results, the manual suggests you use the program at least twice a week, trying six different types of exercises in each session.

Some of the exercises are entirely on the disk. For example, you can work on your pattern-recognition skills by looking for matching words or phrases; the program measures your reading speed as you search for the matches. Or you can read selections on the screen, using the function keys to slow down or speed up the display—it's like running with a companion who paces you to make sure you keep up a certain speed. After each selection, the program will ask you questions about it to measure your comprehension.

Other drills let you work with your own reading materials, using the computer as a stopwatch and speed-calculation tool. The program will also prompt you to do each successive component of the exercises, which is helpful because some of them are quite involved. For instance, the "power drill" has eight steps. You start by reading as fast as you can for 30 seconds. Then you get 30 seconds to construct a "recall pattern," or outline of the main points in the selection. You repeat these steps three times, each time reading and recalling for a longer period.

As you work through the exercises, *The Dynamic Reader* acts as coach and task master, making sure that you complete the reading drills. And since speed

PC
The Evelyn Wood Dynamic Reader
Timeworks, Inc.
444 Lake Cook Rd.
Deerfield, IL 60015
(312) 948-9200
List Price: \$89.95
Requires: 128K RAM, one double-sided disk drive, DOS 2.0 or 2.1.
CIRCLE 787 ON READER SERVICE CARD

We asked: “How do you like using DATA DECISIONS MICROCOMPUTERS?” **They said:**

“I looked at two other micro services but yours was far superior. Your people do a wonderful job on the hands-on evaluations. I particularly appreciate the way you look at a product from a corporate standpoint, not just from the technical point of view.”

Gerald Nadesau, Systems Analyst
Analog Devices, Burlington, MA

“We act as a data resource information center for the rest of the company so we try to stay abreast of just about everything. We use Data Decisions services to answer specific questions on particular products and market sectors and find them a valuable research tool.”

Stephen Lafgren, Group Manager
NEC Systems Laboratory, Boxborough, MA

“Just one report saved me three nights of tinkering at a computer store on my own time. It's like having a consultant sitting right there at the end of the desk.”

Bob Butler, Mechanical Engineer
Gillette Company, Boston, MA

“I'm thoroughly sold on your services and use them almost every day. When I was interviewing with Intel, one of the first questions I asked was whether they had Data Decisions.”

Virginia Franklin, Competitive Market Analyst
Intel Corporation, Austin, TX

“Your analysts explain highly technical concepts without using jargon and yet they don't insult my intelligence. I'd been looking for this type of literature for 11 years and recommend Data Decisions to anyone who needs to know what's happening in the world of information processing.”

Paula Brinson, Computer Manager
Hampton Roads Sanitation District, Virginia Beach, VA

“Your telephone consultants are just outstanding—a really great group. They provide a timely, personal response to virtually any type of inquiry.”

Stan Leu, Director of Marketing
DS Agency, Inc., Lubbock, TX

What are all these people so enthusiastic about? Data Decisions MICROCOMPUTERS is a 3-volume monthly updated reference service that gives you hands-on evaluations of micro software done by specially trained experts who test these products with the corporate micro buyer in mind.

You also get hardware and peripheral analyses that highlight product strengths and limitations... broad-based surveys that quickly lead you to the products that meet your needs...

valid user ratings... lively monthly newsletters... action-oriented technology updates... a comprehensive vendor directory... free telephone consulting... and more.

If you're impressed by what MICROCOMPUTERS is doing for others, simply fill in the coupon to see what it can do for you. Or better yet, phone 609/429-7100.



data decisions microcomputers
20 Brace Road • Cherry Hill, NJ 08034

YES! Please tell me more about Data Decisions MICROCOMPUTERS.

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone _____

A130/Y4

data decisions microcomputers

20 Brace Road • Cherry Hill, NJ 08034 • 609/429-7100

CIRCLE 216 ON READER SERVICE CARD

SPEED READING

reading is a skill that must be practiced to be learned, having a task master that keeps you honest will probably help you achieve your goals. It's also fun to review your progress on the program's scorecard and see how much you've improved.

One drawback to the program's automatic record keeping is that it's not very forgiving of errors. If you're interrupted in the middle of a timed reading and forget to hit the "pause" button, or if you make a mistake in measuring the length of an article you've read, there's no way to go back and undo the damage short of erasing your progress record and starting over again.

In sum, if you want to learn the basics of Evelyn Wood speed reading or if you're an Evelyn Wood graduate looking for a refresher course, you'll probably enjoy working with *The Evelyn Wood Dynamic Reader*.

Speed Reader II

If you've ever taken a standardized test, you remember that awful moment when you were racing through the last series of questions and the proctor called out, "Put your pencils down."

Jan Davidson, director of Upward Bound, a nonprofit learning center in southern California, reasoned that her students could achieve higher scores on their college entrance exams if they could boost their reading speeds. So she teamed up with a programmer to develop *Speed Reader I*, which was soon followed by its current incarnation, *Speed Reader II*.

The program comes on one copy-protected disk, with a second disk of reading selections. For \$10, Davidson and Asso-



Speed Reader II

Davidson and Associates
6069 Grove Oak Pl., #12
Rancho Palos Verdes, CA 90274
(213) 373-9473
List Price: \$69.95

Requires: 64K RAM, one double-sided disk drive, DOS 1.1 or 2.0.

CIRCLE 788 ON READER SERVICE CARD

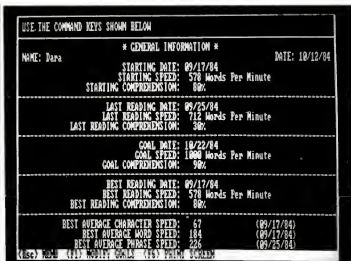


Figure 2: A Dynamic Reader scorecard shows results of previous speed and comprehension tests.

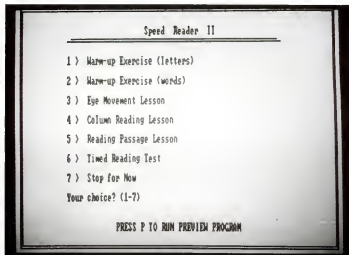


Figure 3: The first five options on Speed Reader II's main menu are exercises designed to improve eye span, perception, and eye movement.

ciates will provide a backup disk of the program to registered owners. The publisher also offers disks with additional reading selections at \$19.95 each.

Because *Speed Reader II* is written in interpreted BASIC, you'll need to copy BASIC.COM from your DOS disk to the program disk before you get going. To

NEC Peripherals.
We make everybody look good.



NEC

NEC Home Electronics (U.S.A.) Inc.

Wherever there's a computer, there's a need for NEC monitors and printers.

Whether you own a business computer, or simply own your own personal computer, owning an NEC monitor and printer makes all the difference in the world.

With a full line of high quality, reliable monitors and printers to choose from, you're sure to find just the right companion for your computer. And they're friendly with just about any computer you can think of. From our very own NEC personal computers to

IBM, Apple, TI, Commodore, Franklin and Atari - PCs, NEC has monitors and printers to make their output look even better.

NEC's complete line of 12-, 13- and 14-inch monitors include RGB, monochrome, color composite and switchable models. Refer to the compatibility chart below for the model that fits your needs.

See your nearest NEC dealer for a demonstration today.

The **JB-1201MA**, with its classic NEC 12" screen, is our renowned best-seller. Its popularity stems from its 1.0 watts of audio output power, and compatibility and versatility for almost any computer application.

\$179.00

Resolution
Horizontal
800 lines (at center)
Vertical
230 lines

Video Bandwidth
18MHz (± 3dB)

Display Character Area
80 characters with 25 lines —
8 x 8 dots

Audio Output Power
1.0 watts



NEC MONITOR COMPATIBILITY CHART

COMPUTER	JB-1270MA	JB-1273MA	JB-1280DA/ JB-1285DA	CP-1305A	JB-1201MA	JB-1205MA	JB-1260MA	JC-1216A	JC-1460DA	JC-14802A	JC-1215A
IBM PC, PCAT & COMPATIBLES	SBICA	SBICA	CI	SBICGRI	SBICA	SBICA	SBICA	SBICGRI	SBICGRI	SBICGRI	SBICA
IBM PC Jr.	RCA	RCA	—	CGRI	RCA	RCA	RCA	CGRI	CGRI	—	RCA
APPLE IIe	RCA	RCA	—	SBICGRI	RCA	RCA	RCA	SBICGRI	SBICGRI	—	RCA
APPLE IIc	RCA	RCA	—	SC	RCA	RCA	RCA	SC	SC	—	—
APPLE IIc	RCA	RCA	—	SI	RCA	RCA	RCA	SI	SI	—	RCA
VIC 20	CG2064	CG2064	—	—	CG2064	CG2064	CG2064	—	—	—	CG2064
COMMODORE 64	CG2064	CG2064	—	—	CG2064	CG2064	CG2064	—	—	—	CG2064
ATARI 600	CG2064	CG2064	—	—	CG2064	CG2064	CG2064	—	—	—	CG2064
ATARI 800/1200	CG2064	CG2064	—	—	CG2064	CG2064	CG2064	—	—	—	CG2064
COLECO ADAM	—	—	—	—	—	—	—	—	—	—	CGCA
TI 994	RCA	RCA	—	—	RCA	RCA	RCA	—	—	—	RCA
FRANKLIN ACE	RCA	RCA	—	—	RCA	RCA	RCA	SBICGRI	SBICGRI	—	RCA
NEC PC-6801A	CI	CI	—	CGR2	CI	CI	CI	CGR2	CGR2	CGR2	—
NEC PC-6201A	**	**	—	**	**	**	**	—	—	—	**
STARLET (PC-6401A)	*	*	—	*CGR2	*	*	*	*CGR2	*CGR2	—	—

RCA NEEDS A TORX SCREW TO HOLD ANY ELECTRONIC TONE

SB NEEDS SPECIAL BOARD SOLD BY ANOTHER VENDOR

CGRI NEEDS NEC CGRI CABLE

SC NEEDS SPECIAL CABLE SOLD BY ANOTHER VENDOR

CI CABLE INCLUDED

CG2064 NEEDS NEC CG2064 CABLE

CGR2 NEEDS SPECIAL INTERFACE SOLD BY ANOTHER VENDOR

CGCA NEEDS NEC CGCA CABLE

CGCA NEEDS NEC CGCA CABLE

** NEEDS NEC PC-6401A CABLE

* NEEDS NEC PC-6401A CABLE

NEC's full line of quality printers includes the impressive PC-PR103A Letter-Perfect and PC-8027A Transportable printers.

Using an innovative Impact Line-Dot type Printhead, the **PC-PR103A** gives you printouts that are practically indistinguishable from letter-quality printers. It also gives you the advantage of printing three times faster, and provides two additional printing modes—graphics and draft quality. It even eliminates "ghosting" with single-pass printing.

\$499.00

Printing Method

Impact Dot Matrix

Print Speed

High Speed Pica 92CPS
High Density Pica 46CPS
Elite 110 CPS
Condensed 78CPS

Buffer Size

4K "Bit Image" type

Paper Feed Method Standard

Friction and Tractor Feed

Interface

Centronics, 8-bit parallel



Weighing only 14 lbs., the **PC-8027A** is the perfect companion for your transportable computer. It has an attached paper bin, and a convenient carrying handle so you can take it anywhere for quick printouts of both text and graphics.

\$499.00

Printing Method

Impact Dot Matrix
Logic Seeking

Speed

105 CPS

Paper Feed Method Standard

Friction and Pin Feed

Interface

Centronics, 8-bit parallel

Buffer Size

2K



Both the PC-PR103A and the PC-8027A give you all the capabilities you'd normally expect from larger printers. And best of all, they cost less than most of the rest.

For software installation, choose the PC-8023A or any teletype-like printer. These choices will work with some software programs. All features of the printer may not be supported. Please contact the software vendor for additional information.



If you're looking for a midsize color monitor, but are concerned about cost, consider the **JC-1216DFA**. It offers the most in a 12" RGB high-resolution color monitor at an affordable price.

\$599.00

Resolution
Horizontal
640 dots
Vertical
240 lines
Video Bandwidth
10MHz
Display Character Area
80 characters with 25 lines —
8 x 8 dots

Make your IBM look better.

Dramatically improve the image of your IBM computer with NEC's new **JB-1280DA**. It's IBM-PC and IBM-PC AT plug-compatible, weighs only 14 lbs., and features a 12" non-glare Phosphor P31 (green) screen. The JB-1280DA — intelligently designed to provide excellent performance, reliable service and high resolution at a very affordable price.

Resolution
Horizontal
720 dots
Vertical
350 lines
Video Bandwidth
20MHz
Display Character Area
80 characters with 25 lines —
8 x 8 dots



#1 for me. NEC

NEC

NEC Home Electronics [U.S.A.] Inc.
Personal Computer Division
1401 Estes Avenue
Elk Grove Village, IL 60007
(312) 228-5900
NEC Corporation
Tokyo, Japan

All specifications and prices are subject to change without notice.
© 1984 NEC Home Electronics [U.S.A.] Inc.

SPEED READING

make the disk self-booting, you also have to copy the necessary DOS programs to the *Speed Reader II* disk.

After these preliminaries are out of the way, using *Speed Reader II* is simplicity itself. The main menu offers five types of exercises (see Figure 3), which stress three components of reading: *eye span*, the number of words you read each time your eye pauses in its journey across the page; *perception*, the time your eye spends during each pause; and *eye movement*, how quickly your eyes can move.

The *Speed Reader II* manual describes how the program's drills and exercises work, and it includes ten lesson plans, each a bit more difficult than the previous one and comprising an assortment of exercises. Alongside each lesson plan is a worksheet where you can record your progress. The program also comes with four sets of duplicate worksheets for other students to use.

In a typical lesson, you would first work on increasing your eye span with a warm-up exercise that displays groups of letters or words at ever-increasing speeds. The display speeds up when you correctly type in the words or letter patterns that have flashed on the screen, and it slows down when you make a mistake. The program keeps a running tally of how well you're doing, which it displays when you've completed the exercise. It's then up to you to record the result on your lesson worksheet.

Then you go on to an eye-movement exercise. Here, *Speed Reader II* displays a reading selection in phrases that flash alternately on the right and left sides of the screen. Before you begin, you choose a reading speed, usually a little faster than the speed you achieved in your previous lesson. When you finish reading, you are asked to answer a set of four multiple-choice questions to measure your comprehension.

Then, depending on your lesson plan, you might try a column-reading exercise. The text is displayed in a narrow column on the screen to give you practice in read-

ing an entire line with each pause of your eye. Or you might do a reading passage exercise. This displays text in a window of from 1 to 12 lines, scrolling at a selected speed. The exercise pushes you to keep reading at your chosen speed for about two typewritten pages of text. As with the eye-movement exercise, at the end the program asks you questions about the reading selection to measure comprehension.

To finish off most lessons, the manual suggests that you turn off the computer and read from a book or magazine, maintaining a brisk reading pace and not allow-

**Speed Reader II
focuses almost
exclusively on
increasing speed.
It offers no
techniques to
increase
comprehension.**

ing yourself to go back and reread.

Speed Reader II includes a bonus for teachers who might want to use the program in the classroom. It has a text editor that allows you to add reading selections to the program. The text editor is primitive, with even fewer functions than the DOS EDLIN program, but it allows you to create reading selections in the *Speed Reader II* format, complete with multiple-choice questions. It will also measure the difficulty of the selection you've entered based on the length of words.

Unlike *The Evelyn Wood Dynamic Reader* and *Speed Reading . . . The Computer Course*, *Speed Reader II* focuses almost exclusively on increasing reading speed and doesn't offer any techniques for increasing comprehension and recall. The rationale, the authors note, is that rapid readers usually understand more of what they read than slow readers—because,

they say, rapid readers read in phrases rather than word by word and thus comprehend the words in context.

So, if greater reading speed is the main thing you're after, and you'd like to get it at the lowest price, *Speed Reader II* is a good choice. (For another look at this program, see "Reading at the Speed of Chips," *PC*, Volume 3 Number 2.)

■Speed Reading . . . The Computer Course

Speed Reading . . . The Computer Course teaches many of the skills covered by the other two programs, but the presentation is a bit more elegant. And it has a premium price tag (\$125) to match its classier style.

The program comes in the IBM-style binder and slipcover that is now de rigueur for programs costing more than \$100, so it may look better on your shelf than the vinyl binders that come with the other two programs.

The actual organization of the course is also different. *Speed Reading* uses the computer to teach concepts, not just to provide drills and exercises. Like the Evelyn Wood program, *Speed Reading* emphasizes techniques to help increase understanding as well as speed. It does this by using interactive tutorials covering such topics as "How to read for main ideas" and "How to skim." These tutorials explain the techniques on-screen and then present examples and ask you questions to test your understanding. In contrast, the other two programs use their



Speed Reading . . . The Computer Course

Bureau of Business Practice
24 Rope Ferry Rd.

Waterford, CT 06386

(800) 243-0876

List Price: \$125

Requires: 96K RAM, one double-sided disk drive, DOS 1.1 or 2.0.

CIRCLE 789 ON READER SERVICE CARD



If you're not sure what's the best multi-function board for your PC, don't give up. Persyst.

Before you look at the board, look at the warranty.

A warranty tells you how much confidence a company has in its products. While other boards get a warranty for just one year, every Persyst board carries a full two-year warranty. Of course, we couldn't afford to give such a strong warranty if we didn't have such a strong product.

Now, look at the quality that goes into our boards.

Every Persyst board gets the best of everything; in materials, design and testing. For instance, they go through a 24-hour burn-in process and system-level testing in an IBM PC with IBM software. The result: a return rate that's the lowest in the industry — just .01%.

Now, it's time to take a look at our SB384 multi-function board.

With our SB384, you get all the innovations and features you need and want. You can have up to 384K in memory. Along with a serial port, a parallel port, game port and a calendar clock. And, it's all on one board!

Plus, the SB384 comes with software for RAM-Disk emulation and print spooling: a total of seven functions in just one slot.

Now you can decide.

As you can see, the best way to decide on which multi-function board is right for you is to look at more than just the board. Examine the warranty that stands behind that board, the quality that goes into it, and the features

it offers. This way you'll discover that Persyst is way ahead of the others in every area.

The Persyst SB384 is a product of Emulex Corporation, an industry leader in the development of high-performance controllers, communications products and packaged subsystems for PCs, micro, mini and super minicomputers. For more information call or write us today: Persyst Products, 3545 Harbor Boulevard, P.O. Box 6725, Costa Mesa, CA 92626. Tel. (714) 662-5600.

CIRCLE 512 ON READER SERVICE CARD

EX **PERSYST**
EMULEX **PERSYST**

SPEED READING

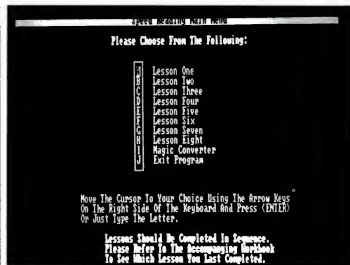


Figure 4: The main menu from Speed Reading . . . The Computer Course.



Figure 5: Each of Speed Reading's lessons has its own lesson menu.

manuals to explain the concepts and techniques of speed reading.

The computerized tutorial approach does have one major drawback, however: it's harder to review the material. For instance, if you wanted to refresh your memory on how to skim, you would have

to turn on your PC, boot up the program, and find the right lesson. That's considerably more complicated than pulling a manual off the shelf and consulting an index to find the right chapter.

Speed Reading comes on three double-sided, copy-protected disks. Because the

program is written in interpreted BASIC, you have to load BASIC from your DOS disk before you get started. If you're unfamiliar with this procedure, the program comes with succinct operating directions printed on a disk-size card. There's no provision for making the disks self-booting, so you'll have to go through this disk-swapping routine each time you use the program.

Speed Reading doesn't have a manual in the usual sense. The program's binder contains practice readings and worksheets where you can record your progress. There is also a short section describing how to use the program's "Magic Converter," which helps you calculate your reading speed when you practice with your own reading materials. The rest of the instructions will appear on screen as you need them.

Each time you begin using *Speed Reading*, the program asks you for your first name and if you've used the course before. If not, it will plunge right into the first lesson. If you've used the program before, *Speed Reading* will ask you to type in your previous reading speed, and then it will offer a choice of lessons (see Figure 4). Unfortunately, this menu doesn't mention the lesson topics, so if you want to review a particular subject, you may have to page through several lessons to find it. Similarly, if you're viewing a lesson for the first time, *Speed Reading* will begin the lesson without any preliminaries, but if you're reviewing a lesson, you can begin with any subsection by using the lesson menu (see Figure 5).

The *Speed Reading* course is divided into eight lessons. Each lesson begins with an interactive tutorial covering a particular aspect of speed reading. For instance, Lesson Two describes bad reading habits and desirable reading skills. Bad habits include subvocalization (repeating a word to yourself while you're reading) and regression (going back to reread a passage). An example of a desirable skill is "prereading," scanning the chapter headings and subheadings of a selection to get a

The Brand NEW Fancy Font 2

printed this ad on an Epson FX printer

Letter Quality

Say goodbye to correspondence quality and hello to *Fancy Font's* high-resolution, proportionally spaced, letter quality. Fonts are available in sizes from 6 to 72 points; styles include Roman, Bold, Italic, Script, Old English, and more. All this on low-cost dot-matrix printers. *Fancy Font* is an easy-to-use software package, developed by SoftCraft, Inc., for IBM PC compatible systems and CP/M systems; no special hardware or installation is required.

New Features Now Available in Version 2

The latest version of *Fancy Font* takes advantage of the phenomenal resolution of the Epson FX and RX printers to achieve laser printer quality. High resolution versions for the Toshiba 1350, 1351, 1340 and the Epson LQ-1500 will soon be available.

This version boasts a greatly expanded set of formatting commands, including word-wrap. Special typesetting features such as kerning and automatic ligature formation are provided by an optional utility.

As part of our library of fonts and utilities we have packages that make *Fancy Font* directly compatible with *Microsoft Word*, *Wordstar* and *Valdora*; if you know how to use any of these word processors then you already know how to use *Fancy Font*. Alternatively, you can still use almost any word processor to create a text file to be printed with *Fancy Font*.

Numerous Applications

Fancy Font customers are constantly discovering new applications.

- Business and personal letters
- Mailing labels from databases
- Custom forms, invoices, signs
- Foreign Languages
- Mathematical Notation, Greek
- Super- and Sub-scripts
- View Graphs
- Custom Letterheads
- Name tags, badges
- Articles for publication
- Newsletters, brochures
- Complete manuals
- Advertisements
- Resumes, invitations

Create Your Own Characters

Hundreds of fonts are available in our font library, and furthermore, you can create any new characters or logos you like, up to 1 inch by 1 inch. A database of over 1500 characters is included that makes it possible to print foreign languages and mathematical notations.

Font Style Samples

small **large** Bold Italic

Sans Serif Script Old English

Φ Ψ Ω Θ Ε Γ Δ Ζ ± × ÷ Η Β Σ Ω Ω ♪ ♫ ♪ ♫ ♪ ♫

"The quality of print is excellent and the variety of type styles is even better."

Pat McKinnon, Indianapolis 4/2/82

Trademark: *Fancy Font* (SoftCraft), *Wordstar* (Micropro), *CP/M* (Digital Research), *Valdora* (Rising Star), *Microsoft*, *IBM*

Order NOW -- (800) 351-0500 -- M/C Visa

MSDOS and CP/M versions are available for the following printers: Epson MX FX LX, IBM Graphics Star General HX, Radix Delta, TI 800 800, Intellifont. MSDOS versions 220, are available or will soon be available for Toshiba 1350 1351 1340, Epson LQ-1500, C-dot, P-Printer, NEC 8058. Specify printer when ordering.

SoftCraft, Inc., 222 State St. #400, Madison, WI 53705, orders (800) 351-0500 (We've moved from California) from Wire: (608) 267-3800
 (Fancy Font System \$180
 (Fancy Font Demo Disk \$10
 (CRAFT and Wise, residents add sales tax 6.5% or 6%
 (Outside US add \$10 postage (only \$2 for demo) \$10 or \$2
 (Domestic format: (IBM PC, Epson QX15, Osborne DG, Kaypro, 8" CP/M, Apple CP/M, Victor)
 (Printer: (Epson FX, Epson MX, etc; see box at left)
 (\$7.50 of demo cost is applicable towards *Fancy Font* purchase.
 (CP/M requires 48K, MSDOS 128K memory.
 (Fully transparent 8-bit printer interface required on Apple and CP/M.

SPEED READING

sense of what it contains. After *Speed Reading* discusses these habits and skills, it asks you to complete a short questionnaire. Then the program tallies your answers and presents you with a "laundry list" of habits you should work to eliminate and a list of skills you should try to acquire.

After each tutorial, there is a set of warm-up exercises. For instance, one exercise helps you expand your range of vision so you can read more words in a single glance. You see a series of letters or words flash on the screen, and then after a pause, the letters reappear briefly to give you a chance to check whether you read them correctly. After repeating this seven times, the program pauses to ask if you want to continue at a faster or slower pace.

The warm-up exercises are followed by an "accelerated reading test," which presents short reading selections on the screen at a slightly faster pace than your previous best speed. Each selection concludes with a short test to measure your comprehension.

Then you choose a reading selection from the binder and use the computer as a stopwatch to measure your reading speed. To conclude, each lesson ends with a final timed reading on the screen. You read this material at your own pace, and again you are given a short test to measure your comprehension. You can record these final results on your worksheets. If you wish, you can also graph your progress on a prepared graph sheet located at the back of the binder.

All in all, *Speed Reading* is a nicely packaged presentation of speed-reading concepts, techniques, and exercises. It's more highly structured than the other two programs—each lesson covers a specific topic and includes a predetermined set of exercises. If you enjoy using a structured approach and want a taste of interactive tutorials, and if the high price doesn't bother you, *Speed Reading*... *The Computer Course* might be the speed-reading program for you.

When you're under the gun to get the job done, where can you turn?



pac microTM

When you need it on time and on the money

The pressure's always on to get the job done, whether you're building a bridge or getting out the company newsletter.

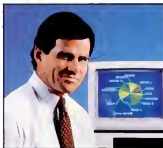
There's only so much time and just so many people to do the work. And nobody wants to hear that it can't be done.

Enter PAC MICRO, a project management software tool from AGS Management Systems. It was created for the IBM® PC (and compatibles) to help you know how to do the job, how long it will take, and what it will cost.

Easy to use— but powerful

All you have to do is tell PAC MICRO what you want to do and in what sequence. PAC MICRO does the rest. And it's all done in simple, uncomplicated English. It lets a manager plan and schedule resources (people, equipment, dollars), as well as let you constantly track progress so you always know what's happening. PAC

MICRO's scheduler uses the critical path method, allows an unlimited number of projects and up to 400 tasks per project. It shows you the critical aspects of a job which could cause delays. You'll know in plenty of time where problems could occur, and you'll also know how to deal with them. Although project management specialists find PAC MICRO to be an extremely convenient desk-top management aid, even those with little or no computer experience have no trouble using it.



Manage any job, large or small

PAC MICRO has everything you need to manage any size project, including

scheduling, budgeting, "what if" simulations, easy-to-read reports, and color graphics. It complements any existing business system, there are no intimidating volumes of documentation to wade through, and it can interface with our mainframe project management systems. It's already being used by Fortune 500 companies, small businesses, government agencies, and the military. The cost is \$990. A demo disk is available for \$100, which is applied toward purchase.

Write or call for more information. PAC MICRO is brought to you by the company that for almost two decades has made project management its one and only business.

AGS Management Systems^{INC.}

*The world's leader in
project management systems*

880 First Avenue
King of Prussia, PA 19406
(215) 265-1550; Telex: 510-6603320

Philadelphia/Atlanta/Chicago/Dallas/Denver/Los Angeles/Minneapolis/Montreal/New York/San Francisco/Toronto/Washington, D.C./Amsterdam/
Barcelona/Jakarta/Johannesburg/London/Milan/Munich/Paris/Sao Paulo/Stockholm/Sydney/Vienna/Zurich

CIRCLE 102 ON READER SERVICE CARD





Computing On the Run

When you need to pick up and go, this carry-on computer carries on, even on international current. But it doesn't rate a special trip.

Some computers square off in front of you and demand to be noticed. Others create a demure and shy effect. The Visual Commuter Computer seems to lean back confidently and greet you with a laconic "Hi, there."

Weighing in at 21 pounds with two floppy disk drives and an LCD display, this "luggable" computer performs its tasks simply and competently, without much of a fuss about anything. Although you cannot operate it with batteries, the Visual will tolerate a wide range of AC voltages comfortably. Local brownouts and international currents pose no obstacle. And the Visual is "luggable": One package holds an LCD screen, keyboard, and two floppy drives; the weight and size make moving it from place to place possible without too much wincing. When you settle down somewhere, you can easily attach external floppy disk drives, modems, external printers, external color graphic monitors, and so forth without modifying the hardware. A built-in facility that emulates an ANSI terminal enables the unit to double as a portable

communications port. Also, the Commuter Computer's relatively high degree of compatibility with the PC is a plus for many users.

Through a Crystal Darkly

LCD displays are still fairly new to the world of desktop computers. Visual's LCD involves it in the current controversy over display technology. You cannot compare Visual's display to the PC's since IBM does not currently offer this technology. And no ideal LCD is available anywhere. However, many other vendors do offer LCD displays. Considering the important criteria of information bandwidth, legibility, and special effects, this LCD does not measure up to the others and certainly not to the ideal.

Strike Up the Bandwidth

The size of the display—16 lines by 80 characters—puts it squarely in the middle of the information bandwidth, as compared to the range of LCD character bandwidths available from other manufacturers. But Visual has made its software for

addressing the screen highly compatible with that meant for the PC's 25-line format. When a program accesses part of the screen outside the 16 lines currently shown, for example, the LCD recenters around the accessed area, in a sort of window. This windowing feature is generally great, except when your program bounces around the screen, in which case your window jumps around somewhat disconcertingly. When you need to see part of the screen not shown, you can use some special control key sequences to force the display to show the upper or lower part of the simulated 25-line screen. An experienced person using a program in which the general contents of the top and the bottom of the screen are well known or consistent would find these control sequences more than adequate. But a beginner working with a program that uses the screen to convey status information at the top and operating space at the bottom could get confused.

On a dot basis the screen's bandwidth is comparable with that of a normal monitor, although graphs are displayed in the windowed form, of course. The actual resolution available is 640 by 200 pixels, and thus monochrome graphs on the LCD can be fairly detailed. However, this resolution is not as good as that of some other LCDs.

Legibility is only fair. The LCD screen flickers, and no lighting, daylight or artificial, corrects the problem. The flicker is especially pronounced on programs that use reverse-video effects. It diminishes in

Legibility is only fair. The LCD screen flickers, and no lighting, daylight or artificial, corrects the problem.



direct proportion to the contrast: the minimum contrast causes the minimum flicker. But no contrast control setting both eliminates flicker and displays characters with acceptable contrast.

The characters are nearly the same size as those on an IBM monitor. Their shape is acceptable, but they are not as elaborately formed as those of some other vendors. The lack of elaboration means that no real blank guard band appears between the lines. So occasionally a descender on one character bleeds into a high spot on the letter below it; a lowercase y may touch an uppercase T below it, for example. The characters are razor sharp, as you would expect, except that at some contrast settings a strange kind of vertical streaking occurs below a character if the space under it is blank. Side-by-side comparison with the Sharp PC-5000 8x80 LCD display, the STM Portable PC 25x80 LCD display, and the HP-110 16x80 display reveals that Visual has a less-elegant approach to exploiting this technology.

The fold-up display screen opens to only one angle; tilting it to minimize room reflections is a matter of wedging the right-sized matchbook into the hinges. Jacks are supplied for connecting external monochrome or color monitors, which operate without modifying the Visual. Although a monitor makes the machine less portable, you'll probably want to switch to using one for long work sessions.

The LCD special effects are limited to reverse video and blinking characters. No alternate fonts, underlining, or 40-column modes are possible on the LCD. Plotting characters are provided. Be careful of the LCD's electrical connecting cord when closing the unit; it always catches on the hinge or the unit's corner.

Low-Budget Communications

The handle on the Visual Computer Computer invites you to use it all around town, and maybe even take it to Paris. When you accept the machine's invitation to pick up and go, you're also tempted to call up remote computers. The machine promises terminal facilities in ROM but lets you down when you are in terminal mode. You can't suspend terminal mode to use a program under MS-DOS temporarily. In fact, you can't get back to MS-DOS without rebooting, a 40-second exercise. Similarly, if you're using MS-DOS, you can't get into terminal mode without completely restarting. (When will software writers learn that a feature with a tortuous entry and exit sequence is a *non*-feature? No one will use it, or someone will bypass it with a smoother approach.)

Setting up the speed and parity parameters for terminal usage is easy, but the machine does not remember them between power-down cycles. So, unless they just happen to match the Visual's default choices, you have to reset them each time. The terminal that is emulated responds to ANSI control signals, so you can call up a computer that uses video editors and such things. But since the terminal facility gives

Visual Computer Computer

Visual Technology

540 Main Street

Tewksbury, MA 01876

(617) 851-5000

List Price: \$1995 (includes 128K RAM, and one disk drive). Base unit plus second drive, 256K RAM, and LCD display is \$2995.

CIRCLE 800 ON READER SERVICE CARD

you no way to upload or download files while you are in it, this machine, with all its power, becomes nearly useless for preparing terminal work off-line.

The PC does not have anything like the Visual's facility built into it, but Visual's halfway approach may be worse than no approach at all. A novice doing very simple remote work will find Visual's communications support easy and useful. But an experienced user with more elaborate tasks to handle will need to purchase more sophisticated communications software to run on the Visual.

Handling It

The most unusual feature of the hardware is Visual's carrying handle. Big enough to be a tow bar for water skiers, strong enough to do chin ups on, and sleek enough to put in the Museum of Modern Art, it is the first handle I've found that passes the five-block test: can you carry the unit five blocks without having the handle make deep grooves in your grip fingers?

The general styling of the rest of the unit is subdued; in fact, it's almost severe. The principal colors are off-white and black, with a few gray keys sprinkled here and there. The lines of the chassis are squared off.

The layout of the keyboard is similar to that of the PC, but the touch is different. IBM's clacking sound is replaced by a slight beep, which you can turn off. Small ridges on the home keys help orient touch typists. In addition, since the CapsLock and NumLock keys light up when you depress them, it's easy to keep track of whether or not they are in use.

The unit's cooling fan sounds like a quarter-ton air conditioner, adding 8 to 12 decibels to my usual 50-decibel office noise level. The Epson floppy disk drives in the Visual, however, are much quieter than those on the PC. The unit has a recess on the back for all the expansion jacks. I found the recess very recessed—getting a grip on things as I pushed them in or pulled them out cramped my fingers.

Inside, the unit holds no surprises. No miniaturization is apparent, with standard-size parts and integrated circuits used in all visible cases. The layout is not cramped. One main board contains a NEC 8088 and support chips. Several wires lightly tacked down with cement ran from various solder points on the board, indicating either last-minute engineering fixes or a complicated board structure. A separate board holds

the power supply. Replacing either of these boards would be necessary for repair. Disk drives are also mounted in modular form. A set of ROMs makes for a thorough group of self-diagnostic tests.

Not a Speeder

The Visual Commuter Computer lawfully abides by the PC's speed limits. Applying the prime number test PC used

PERFORMANCE CHART

HARDWARE	Excellent Points	Good Points	Annoyances	Needs Work
Main unit:	Comfortable carrying handle	<ul style="list-style-type: none"> Weight Compactness Expandability Built-in self tests Wide operating voltage range 8087 capability 	<ul style="list-style-type: none"> Crowded access to expansion sockets 	<ul style="list-style-type: none"> Noisy cooling fan
LCD:	Sharpness of image	<ul style="list-style-type: none"> 25-line simulation Ability to switch to external monitor Hardware modification not needed for external color graphics 	<ul style="list-style-type: none"> Contrast Size of Display Vertical streaking of characters Untidy connecting cable Character shape 	<ul style="list-style-type: none"> Flicker Lack of tilt feature
Mini-floppy:	Disk	<ul style="list-style-type: none"> IBM format compatibility Quiet operation 		
SOFTWARE	Excellent Points	Good Points	Annoyances	Needs Work
Documentation:		<ul style="list-style-type: none"> Sturdy binders 	<ul style="list-style-type: none"> Typos and errors in operation guide No internal manuals Not much bundled software provided 	
Communications:		<ul style="list-style-type: none"> Easy for novice 	<ul style="list-style-type: none"> Tortuous context shift to MS-DOS or other tools 	<ul style="list-style-type: none"> Inability to upload or download files

This table summarizes the various features and flaws of the Visual Commuter Computer. Excellent Points means you should drop everything and write your mom about this astounding, mind-boggling feature. Good Points means that you will indicate that you are a member of the Inner Circle by speaking favorably about this feature. Items in the Annoyances category are the ones that you wish would really just quietly go away because they form an unsightly blot on an otherwise well-crafted instrument. Needs Work means that the person responsible for approving this omission, bug, or nonfeature lacks discriminating taste and foresight and should be ordered to fix it as soon as possible—or earlier.

to shake out other IBM compatibles (see the cover stories in *PC*, Volume 3 Number 6), I found that the Visual took 1 minute and 36 seconds using the LCD as a display, as compared to the PC's 1 minute. Using an external color monitor for a display caused the time to drop slightly, to 1 minute and 31 seconds. A compiled C program that wrote a file of 20 records of 1,024 bytes each to disk 10 times took 55 seconds, the same rate as the PC. The same number of read operations took 58 seconds, again like the PC's speed.

Something Completely Different

Visual's operator's guide claims that the Visual Commuter Computer is completely compatible with the PC. I wish the bank had the same definition of *complete* as Visual's copywriters, because then when my bank tells me that my account is completely overdrawn I'd know that maybe \$5 or \$6 thousand are left in it.

The Visual reads and writes PC-format disks just fine. But it won't run *Flight Simulator*, Microsoft's *Word*, or IBM's *Diagnostics Programs*. When you try, it hangs in hyperspace. When running BASIC programs from the PC-DOS distribution disk, the machine is clever enough to first realize that Visual's own BASIC isn't loaded and then to prompt for it. But after you load Visual's BASIC, the screen sometimes gets badly overwritten; the LCD gags while valiantly trying to digest the COLOR statements in the BASIC code.

On the plus side, the Visual runs *WordStar*, Lotus's *1-2-3*, *dBASE III*, and *MultiMate*, and it boots and runs PC-DOS, all while using the LCD. Programs that don't care about screen characteristics run perfectly. So, for example, Whitesmith's C compiler runs without a hitch. Whitesmith's UNIX-type operating system, *Idris*, also runs, even supporting one additional user typing on a separate terminal connected to the built-in communications port. *Completely compatible*? No, not with the LCD unit in operation. But things do brighten up considerably if you use an external monitor.

The carrying handle is the first I've found that truly passes the five block test.



Waiting for the Sequel

Neatly summarizing something as complex as a computer system always risks missing the mark. The *Guide Michelin* rates the bewildering variety and subtlety of the noteworthy restaurants in the whole of France. The effort one should expend to get to each restaurant determines its rating. You can rate computer

systems this way too, awarding them floppy disks. A computer system gets four floppy disks if it is highly addictive when you use it and worth a special trip to your friendly neighborhood computer store to check it out and three floppy disks if it is worth a detour to your computer store. A rating of two floppy disks is for a machine that is distinguished but significantly less so than the best in its class (look at it if you're already in the store). One floppy disk is for one that is ordinary, a "me too" machine. A machine without redeeming social value gets zero floppy disks.

The Visual Commuter Computer could be quite an attention-getter if it came with a 25-line display, built-in hard disk, and modem all at its current price. At this time, though, it is not dramatically competitive in cost, and machines with more engaging features are available. So the competent Visual Commuter Computer rates one and a half floppy disks. Let's hope Visual's next entry into the field delivers more punch. ■



The size of the LCD display is 16 lines by 80 characters.

DATAEASE™

*"I was very impressed
with its overall performance
and features... excellent interactive
and data quality assurance capabilities
... relatively easy to master..."*

Bill Jacobson
From a feature article in
BYTE, October 1984

Over 20,000 large and small business clients worldwide have turned to DATAEASE to increase productivity. In fact, leading software suppliers to Corporate America like MIS, Inc. have recently sold more DATAEASE than dBASEIII®, Symphony™, Framework™ and R:BASE™ 4000!

DATAEASE, with its ideal combination of power and ease-of-use lets you harness the full power of your micro to create forms and custom menus; gather, sort, group and calculate statistical information; update and link files; generate standard or custom reports; interchange data with mainframes and popular programs.

DATAEASE, the complete information management system. Available through highly competent dealers throughout the U.S. Call or write for information on The SOFTEASE Family of Products™: DATAEASE, WORDEASE™, GRAPHEASE™, DOSEASE™.

DATAEASE PCM-3/85

Demonstration Diskette

- Check one ☐ IBM PC ☐ WANG ☐ DEC ☐ TI
☐ Check attached for \$10. Send information package with demonstration
☐ Send information only.

Name

Title Phone

Company

Street

City State Zip

Software Solutions, Inc., 305 Bic Drive,
Milford, CT 06460 • 203-877-9268 • Telex: 703972

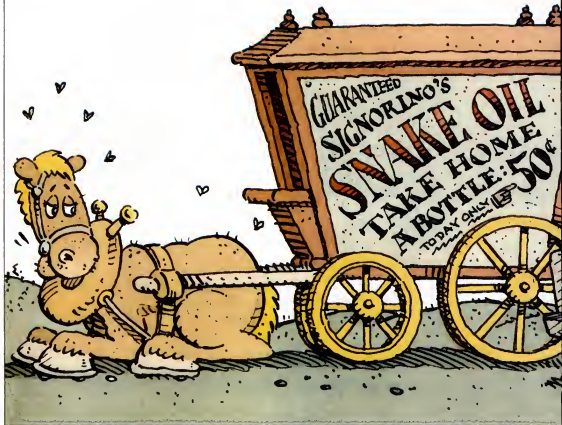
For dealer, corporate and product information call:

800-243-5123

Scandinavia West Soft A/S, Ålesund, Norway; (47) 71-41341	South Africa Dataflex, Craighill, 11724 8555
United Kingdom Sagipac Systems, Essex, 01-544-0562	West Germany Markt & Technik, Munich, 089-4613-0

© 1985 Software Solutions, Inc.

Software for the HARD SELL



By applying a little science to the elusive art of selling, these packages offer salespeople help in clinching the deal.

Modern sales techniques stress the friendly art of persuasion. Handling people and knowing how they think and act are what super salespeople do well. How could something as seemingly technical and impersonal as a computer help salespeople master theories of mutual gain and win-win strategies and cope with their high-pressured world?

You could argue that a computer can't help you firm up your handshake, main-

tain eye contact, freshen a smile, polish a presentation, or make a quick closing. Yet four new software packages train salespeople in the basics, plus help manage the details of the job. They can even help you analyze your style and persuade those ever-elusive customers. And since they make the sales load a little easier to bear, perhaps they do make it a lot easier to smile. Can we shake on that?

Those of you who are just starting out in sales will want to look at *SOLD!* which



HARD SELL

gives basic training in sales. If insurance is your game, *Insurance Sales Maker* will help you keep track of your clients and their insurance needs. *EasySales Pro* can help you manage a large customer database and supervise the efforts of a sales team. And if the psychology of selling is what really has you hooked, *The Sales Edge* could be the perfect tool to help you analyze your selling style and develop strategies based on your customers' personalities.

■ SOLD!

Even the world's greatest salesperson had to learn the fundamentals of selling first. If you or someone in your company needs groundwork in the basics before being turned loose on the customers, *SOLD!*, from Courseware, Inc., can help.

SOLD!, written in BASICA, is easy to use. Even if you're a computer novice, you can run it. When you boot the program, *SOLD!* presents you with four introductory screens and then a menu with options to train for planning a sales call, practice your new-found skills with some sales call simulations, or return to DOS.

If you choose the training option, *SOLD!* responds with a quick description of the handful of keys used by the package and several screens of information on how to sell. The material is presented clearly, with mini-quizzes on complex concepts included to test your knowledge.

The training lesson presents the seven major steps for successfully planning a

Bonus Sales Manager gives someone unfamiliar with computers a start in maintaining a specialized database.



sales call. You can go through the whole lesson in about 15 minutes. But after several times through it, I felt as though I had just returned from an elegant restaurant where I was served soup, salad, and dessert; the setting was nice, but the main course was missing. *SOLD!*'s lesson lacks substance.

With the second option, you can put your knowledge to the test in a gamelike simulation of several actual sales calls. You're awarded points for responding correctly to scenarios the computer sets up. I found myself keenly interested in making it to the "Winner's Circle" as I met prospect after prospect, gathering information and making sales.

The simulation is limited, however; it does not become progressively more challenging. Nonetheless, it can be useful as a standard training module for newly hired or inexperienced sales employees.

SOLD! also includes on a separate disk a customer database manager called Bonus Sales Manager; it takes a fill-in-the-blanks approach to developing a sales database. With it you create, in effect, an electronic Rolodex for storing and retrieving basic data on customers or potential customers. Unfortunately, you can't

change any of Bonus Sales Manager's pre-set fields or records.

The Data Manager field allows you to store customer names, addresses, and telephone numbers. The package has a few more fields, such as Notes and Action Date, but it offers less flexibility than a manual file system. The Bonus disk holds no more than approximately 400 records, and the documentation candidly suggests that you consider buying a better file management system if you require a larger capacity.

You can search for, display, and print individual records, using criteria such as "not," "less than," "greater than," "equal to," "in the range of," and "contain." You can use more than one criterion at one time. Bonus Sales Manager, although not the most powerful data manager, gives someone unfamiliar with computers a start in maintaining a specialized database. The program is menu driven, and the operating system is completely transparent.

SOLD! is not a package for the experienced salesperson. If you are comfortable with selling and with your PC, the package may not have much to offer. On the other hand, it's a good entry-level package for those who are new at selling and new at computers.

The color displays generated by the package were quite stunning on my RGB monitor. A lot of care and attention went into making them easy to read. When I ran the package on another PC with an amber monitor, I found a number of the screens difficult to read.

SOLD! has some of the most attractive graphics I have seen in a software package. The colors complement each other, and the shading creates depth. It looks very professional.

Unfortunately, the instructional material didn't match up to the color displays. I didn't feel that the tutorial would prepare me to start a career in sales. And the first two pages of the documentation suggest that the program will be "fun," but it wasn't fun for me.



SOLD!

Courseware, Inc.
10075 Carroll Canyon Rd.
San Diego, CA 92131
(619) 578-1700

List Price: \$79.50 (includes Bonus Sales Manager)

Requires: 128K RAM, one double-sided disk drive.

CIRCLE 700 ON READER SERVICE CARD

```

INSURE - 1.0          * * INSURANCE SALES SYSTEM * *          07-04-1984
      (N)EW, (C)HANGE, (D)ELETE, (I)NQUIRY, (R)EPORTS, (E)XIT ?

      CLIENT NAME : .....

      1) ADDRESS LINE 1: .....
      2) ADDRESS LINE 2: .....
      3) CITY / TOWN : .....
      4) STATE : ..
      5) ZIP CODE : .....
      6) CONTACT NAME : .....
      7) TITLE/PROFESS.: .....
      8) TELEPHONE : .....
      9) ORIGIN DATE : MM/DD/YY
     10) PRODUCER : .. SIC ..... NO.EMP .....
                TYPE ANNIV. INS.CO STATS
     11) COVERAGE : ..... MM/DD/YY .....
     12) COVERAGE : ..... MM/DD/YY .....
     13) COVERAGE : ..... MM/DD/YY .....
     14) COVERAGE : ..... MM/DD/YY .....
     15) COVERAGE : ..... MM/DD/YY .....
     16) COVERAGE : ..... MM/DD/YY .....

      * * COPYRIGHT 1983 EXECU-RECORD INC. * *

```

Figure 1: These fields are available in Insurance Sales Maker.

Insurance Sales Maker

If you already know how to sell and want to use the PC to track your clients, several programs can do the job for you. You can use some packages regardless of what you sell; others are for those who sell particular products. *Insurance Sales Maker*, from Execu-Record, Inc., of Boring, Oregon, is a no-frills program for people who sell insurance. It will help you track and sort information on both customers and prospects, but it doesn't offer many advanced features.

Insurance Sales Maker has an install program that allows you to make the disks

self-booting, but only if you use DOS 1.x. I run DOS 2.1 on my machine, so I didn't get to try it. But I have an extensive AUTOEXEC program that I like to use whenever I boot my system, and I usually try to disable any self-booting packages. If you aren't experienced with computers, don't worry; the documentation will walk you through the start-up process.

The first screen the program gave me was the one I used the most. It displayed all the fields in a single record, along with a single-line menu of my options. From there I could enter new records, change or delete existing records, call up any record or series of records, produce some reports, or return to DOS.

The program limited me to uppercase letters, and it does not use color. In addition to some fairly standard customer name-and-address fields, the package offers several insurance-related fields such as policy origin date; producer; and six lines of coverage with anniversary dates, insurance company, and statistics (Figure 1). You can't change the size or number of fields. Your data management needs must

match the program's capabilities fairly closely.

I found adding, deleting, and modifying records to be straightforward. Experienced PC users who skip the documentation entirely might run into problems if they enter commas, expressly forbidden by the documentation.

Selecting the Inquiry option from the main menu, you can call up any record by client name. The match can be as simple as a single letter (only the first letter of the name) or a precise multiletter match. One welcome option is that you can use an asterisk for a wildcard search the same way you do in DOS.

I was able to print various reports, including a client list, a to-do list, and a done list. With the to-do and done lists, you can print all correspondence in a client's data file or just the selected correspondence between any two dates. The client list can be sorted five ways, including by all clients, producer, standard industry code, coverage, or specific client. Your output can be labels or a report, directed to the screen or printer. (continued)



Insurance Sales Maker

Execu-Record, Inc.
15525 S.E. 329 Ave.
Boring, OR 97009
(503) 668-9762
List Price: \$195

Requires: 128K RAM, one DSDD drive.

CIRCLE 698 ON READER SERVICE CARD

Company Offers FREE OVERNIGHT DELIVERY!!!

New customer service policy expected to set a new standard in the mail order industry!

BY MICHAEL CHRISTOPHER

GARDEN CITY, N.Y.—Mr. David W. Pasternack, President of Logisoft, a major IBM PC software and hardware distributor, has announced the inception of a unique new customer service policy. . . free overnight courier delivery on their entire product line.

In a recent interview, Mr. Pasternack stated that "We feel our new free overnight

delivery service will set a new standard in the computer software mail order industry. In a study we conducted, we found that in addition to competitive pricing, expedience was a factor utmost in our customer's minds. Whether their order was \$300 or \$3000, the need to get their package as soon as possible was the same. Under our old procedures, between processing and shipping time, it could take up to a week and a half to two weeks for an order to arrive. With our new courier service, an order can be processed, shipped, and arrive in our customer's hands in only 3 working days. . . at no additional charge!"

The company is using Emery Worldwide to handle the large number of packages being shipped each evening for next day delivery. "We chose Emery for their competitive pricing structure and excellent delivery record", said Mr. Pasternack. Emery was quoted as saying, "This makes Logisoft the largest single Emery account in the New York Metro area.



LOGICTP OF THE MONTH

Choosing software can be mind-boggling. With the proliferation of publishers, how do you choose. Analyze your needs. . . what specific tasks do you want to perform. Read the software reviews; an excellent way to evaluate a package. Ask around. . . you'd be surprised how many associates may be using a package similar to your application. Finally, choose the best package (not always the most expensive). Upgrading will end up costing you more. Remember the key word is research.

TOLL-FREE SUPPORT A Smashing Success

GARDEN CITY, N.Y.—A survey of Logisoft's toll-free technical support policy was done to see if it warranted the continued costs of the 800 toll-free number, personnel costs, etc. After careful monitoring of these calls (both pre-sale and after sale) it was found that 92% of the calls were for legitimate technical support questions rather than for answers already contained in the softwares' operations manual. As a result of the survey, the decision has been made to continue toll-free support as an important part of their customer service.

This service consists of assisting with: • Hardware requirements • Initial boot-up procedures • Initial software configuration (printers, disc drive, etc.) • Back-up procedures • Defective program determination • Alternative program recommendation • Return policy

Logisoft's Lowest Price Guarantee Still Effective

GARDEN CITY, N.Y.—Logisoft, Inc. has indicated that their long time policy of guaranteeing the lowest prices in the mail order market is still being offered and will not be affected by their new free overnight delivery service. "We will continue to beat any price by \$10" a company spokesman said. "We'd be crazy to fool with success", he stated; "since the inception of our lowest price guarantee, sales have skyrocketed."

When asked how Logisoft could afford to give their customers free overnight delivery plus beat any price by \$10, they replied "Buying Power". "Very simply", they said, we buy at the best possible prices and pass those savings along to our customers".

CONTINUOUS STATIONERY: BIG BUSINESS, But "Where's The Class?"

NEW YORK—The growth of Logicforms, Inc., a member of the Logic Group, has been phenomenal. Mr. Ralph Corso, President of Logicforms explains why. "Up until now, buying continuous stationery through the mail has been a take what's available situation". "First off", he said, "almost all mail order firms offer only stock letterheads & envelopes with limited typesets, colors and stock logos from which to choose, but, 'where's the class?'"

"The individual style and design of a letterhead", said Mr. Corso, "reflects the professionalism and personality of a company and should not have to change because they now have a printer and the need for continuous stationery. While other mail order firms are limited in the variety they can offer, Logicforms specializes in custom stationery. Logicforms offers a large selection of quality paper, ink colors and special effects such as thermography, blind embossing, foil stamping and multi-color printing." Mr. Corso went on to say that

"whether a customer chooses to supply his own artwork or printed letterhead, or wishes to select from our vast array of stock designs. . . We are the Logical Choice".

For a free sample/pricing kit and a handy re-usable shipping envelope for artwork, simply call toll-free 1-800-645-3491 or send a sample of your current stationery for a free price quote. Mail to Logicforms, Inc., 300 Garden City Plaza, Garden City, N.Y. 11530

LOGICSOFT INTRODUCES...
An Incredible New Service Breakthrough!

FREE OVERNIGHT DELIVERY!

VIA... **EMERY**
WORLDWIDE

PLUS... We'll Continue To
Beat Any \$10
Price By...

THAT'S RIGHT! OUR LOWEST PRICE GUARANTEE IS STILL EFFECTIVE! Tell us the advertiser and price of any software or hardware item on this card currently advertised in any popular computer publication and we'll beat that price by \$10. This offer does not apply to items under \$100 or where the price is not lower than Logicsoft's.

SOFTWARE

(Immediate Replacement on any Defective Product)

WORD PROCESSING

	Lowest Price
Wordstar 2000	\$275
Wordstar Pro Pac	\$295
Wordperfect	\$289
Microsoft Word with Mouse	\$269
Multimate	\$185
Peachtext 5000	\$169
Voicewriter Deluxe	\$165
Easywriter II (Speaker Mailer)	\$255
Edix & Wordx	\$225
Finalword	\$319
Samwise Wizard III	\$259
ZyWing II Plus	\$139
Think Tank	\$115
Wordplus (Datasix)	

DATA BASE MANAGEMENT

Knowledgebase	\$275
TIM IV	\$269
R Base 4000	\$295
dBASE III	\$369
dBASE II	\$295
Quickcode III	\$179
Concord II	\$325
Data Base Manager II (Alpha)	\$195
Intostar Plus	\$295
Friday	\$199
pts file & pts report	\$165
Revelation	\$759
PowerBase	\$295
Personal Pearl	\$229

INTEGRATED/SPREADSHEETS

Enable	\$546
Smart Software	Lowest Price
Aura	\$299
Open Access	\$385
Electric Desk	\$219
Framework	\$369
Symphony	\$429
Lotus 1-2-3	\$309
Corporate MBA	\$509
Supercalc 3	\$195
Multiphan	\$135
TH Solver	\$299

GRAPHICS

BPS Graphics	\$289
Fast Graphics	\$199
Chartmaster	\$279
Sprymaster	\$195
pts graph	\$ 85
Graphwriter Combo Pak	\$475
Energraphics	\$269
PC Draw	\$295
Chart (Microsoft)	\$179

Over 400 Additional Titles In Stock!

All factory sealed, complete with manuals and full Manufacturer's Warranty!

FINANCIAL/SCHEDULERS

Managing Your Money (Tobias)	\$159
Financier II	\$115
Colliers & Sense	\$115
Market Manager (Dow Jones)	\$229
Market Analyzer (Dow Jones)	\$299
Market Microscope (Dow Jones)	\$259
POPP II (Best)	\$199
Microsoft Project	\$175
Harvard Project Manager	\$319
Project Scheduler (Scitor)	\$195

LARGEST SELECTION OF TAX PACKAGES

LANGUAGES/UTILITIES

Concurrent (DPM5 w/Windows (DR)	\$225
Pascal MIT + (SR)	\$235
PL/1 (DR)	\$479
Display Manager (DR)	\$359
Access Manager	\$299
Lattice C Compiler (Lifeboat)	\$299
OS Cobol III (DR)	\$479
Pascal Compiler (MS)	\$245
C Compiler (MS)	\$325
Microsoft Sort	\$199
Cobol Compiler (MS)	\$495
Business Basic (MS)	\$369
Fortran Compiler (MS)	\$245
Prokey 3.0	\$ 99
Norton Utilities	\$ 55
C Food Smartboard	\$ 119
Crosstalk XVI	\$105

Prices subject to change without notice.

SEE REVERSE SIDE FOR ACCOUNTING SYSTEMS AND HARDWARE



* NO SURCHARGE for VISA or MasterCard • Purchase Orders Welcome from Qualified Institutions. NO SURCHARGE • No Sales Tax on Orders Outside N.Y. State • Please add 2% for handling and insurance (on all orders over \$1) • Payment: MasterCard, VISA, American Exp., C.O.D., Money Order or Check

1-800-645-3491

New York State 516-741-0043 Canada

416-283-2354

Domestic/International Telex

286905 Soft UR

LOGICSOFT

THE LOGICAL CHOICE

A Member of the Logic Group

300 Garden City Plaza, Garden City, New York 11530

CONFUSED OVER ACCOUNTING SYSTEMS?

We don't blame you, that's why we invite you to give us a call.

We've evaluated over 50 of them and just because you choose to buy through a mail order company shouldn't mean you have to sacrifice service...We want to take the time to assist you before you buy. We realize that an accounting system can add up to a sizeable investment and helping you end up with the right package for your money is what doing business is all about.



INFORMATION UNLIMITED SOFTWARE (IUS)

- General Ledger • Inventory
- Accounts Payable • Order Entry
- Accounts Receivable

\$295 Per Module

Payroll **\$359**
Financial Series (GL, A/P, A/R) **\$599**

PEACHTREE SERIES B

- General Ledger • Accounts Payable
- Accounts Receivable • Payroll • Inventory
- Sales Invoicing • Job Costing

\$375 Per Module

ACCOUNTING SYSTEMS

OPEN SYSTEMS

- General Ledger • Accounts Payable
- Accounts Receivable • Payroll • Inventory
- Sales Order Processing • Job Costing
- Material Management • Fixed Assets
- Purchase Order Processing

\$399 Per Module

REALWORLD (MBSI)

- General Ledger • Accounts Payable
- Accounts Receivable • Payroll
- Order Entry/Inventory

\$575 Per Module

TCS

- Client Write Up

\$1195

STATE OF THE ART

- General Ledger • Accounts Payable
- Accounts Receivable • Payroll • Inventory
- Sales Invoicing

\$479 Per Module

Time Keeping & Billing **\$679**

BPI

- General Ledger • Accounts Payable
- Accounts Receivable • Payroll

\$395 Per Module

Inventory **\$529**
Job Costing **\$529**

GREAT PLAINS SOFTWARE

- General Ledger • Accounts Receivable
- Accounts Payable • Payroll • Inventory

\$579 Per Module

HARDWARE

AST RESEARCH

AST-5251 **\$699**
AST-SNA **\$699**
AST-BSC **\$699**
AST-3870 **\$740**
SixPakPlus 64k **\$265**
MegaPlus II 64k **\$265**
I/O Plus II **\$125**
Monograph Plus **\$425**

QUADRAM

Quadboard 64k **\$265**
Quadlink **\$440**
Quadcolor I **\$195**
Quadcolor II **\$465**
Quadmodem (internal) **\$570**
Quadmodem (external) **\$625**

IDEA

IDEAmax 384 **\$250**
IDEAplus **Lowest Price**

KENSINGTON MICROWARE

MasterPiece **\$115**

DCA

IRMA Board **\$800**

STB

Super Rio **\$400**
Rio Plus II **\$240**
Graphics Master **\$545**
Graphics Plus II **\$345**

MA SYSTEMS

Peacock Color Board **\$245**

TECMAR

Caplain **\$265**
Graphics Master **\$475**

HERCULES

Graphics Card **\$335**
Color Card **\$175**

PARADISE SYSTEMS

MultiDisplay Card **\$285**
Modular Graphics Card **Lowest Price**

PERSYST

Monochrome Card **\$199**

MYLEX

Chairman **\$495**

PLANTRONICS/FREDERICK

Colorplus **\$375**

MOUSE SYSTEMS

PC Mouse **\$145**

ORCHID

Blossom, 64k **\$235**

HAYES

Smartmodem 300 **\$199**
Smartmodem 1200 **\$485**
Smartmodem 1200B (w/Smartmodem II) **\$399**
Cable (IBM) **\$25**

NOVATION

Smart-Cat 103/212 **\$439**
Smart-Cat 103 **\$185**
Smart-Cat Plus **\$355**

KEY TRONIC

Typewriter Keyboard (5150) **\$150**
Deluxe Keyboard (5151) **\$180**

US ROBOTICS

Auto-Dial 300/1200 **\$455**
S-100 Modem **\$345**

MEMORY CHIPS

(200ns) 64k **\$45**

Introducing Personal Computers Designed to Produce

THE LOGICTRAK DD5

One of the finest Diskettes available! Every one is certified 100% Error Free!

Our 5 1/4" double sided, double density, soft sector floppy diskettes are manufactured to the highest tolerances. Each diskette carries the **Logisoft Lifetime Guarantee**. If any of our diskettes fails to format or exhibits any data retention errors, we will replace it, **Free of charge**. Diskettes come complete in our handy easy-to-use reusable box, pre-labeled for fast, easy reference. Packed ten diskettes per box. These are the same diskettes trusted by the largest software publishers in the country.

20+ Boxes

\$235

Per Disk

10-19 Boxes

\$250

Per Disk

2-9 Boxes

\$299

Per Disk

1 Box

\$399

Per Disk

LIFETIME GUARANTEE!

LOGISOFT can assist you in these major areas with Toll-Free Support!

- Hardware requirements • Initial boot-up procedures • Initial software configuration (printers, disk drive, etc.) • Backup procedures • Defective program determination
- Alternative program recommendations • Software return policy.

1-800-645-3491

New York State • 516-741-0043

Canada • 416-293-2354

Domestic/International Telex

286905 Soft UR

THE LOGICAL CHOICE

A Member of the Logic Group

300 Garden City Plaza, Garden City, New York 11530



TEAR AND COMPARE!

TEAR AND COMPARE!

TEAR AND COMPARE!

TEAR AND COMPARE!

TRANSTECTOR Has A Better Way To Eliminate Computer Malfunctions.



Computer foul-ups are enough to bring out the beast in even the most patient of individuals. But when random logic errors, memory loss, software damage or component failures have driven you to the brink, don't resort to wielding a sledgehammer. Fight back with TRANSTECTOR SYSTEMS.

TRANSTECTOR is the world's leading manufacturer of transient overvoltage protection systems for sensitive electronics. In fact, many FORTUNE 500 companies, such as NCR, General Electric Medical Systems and Johnson Controls, have chosen TRANSTECTOR to safeguard equipment they sell.

Now, that same famous technology is available to you. Ask your dealer for details on how TRANSTECTOR protectors can save you money—not to mention your mental health.

TRANSTECTOR[®]

10701 Airport Dr.
Hayden Lake, ID 83835
(208) 772-8515

For the name of the
TRANSTECTOR SYSTEMS
authorized dealer nearest you,
call toll-free:

800-635-2537



©1985 Transtector Systems • TRANSTECTOR is a registered trademark of Transtector Systems, Inc.

CIRCLE 517 ON READER SERVICE CARD

FREE POSTER!
If you can empathize with the poor soul in this photo, you'll want an attractive color poster (\$7.50 value) to remind you that **There Is A Better Way...**
Get your very own poster FREE with the purchase of any TRANSTECTOR protector from your local authorized TRANSTECTOR dealer.

HARD SELL

A few frills would have been welcome. A case in point: I was getting ready to print a client list and had made almost all the choices necessary before the actual printing when I remembered that I had to update another client. To my dismay, I discovered that there's no way to back out of a decision once you make it. I was forced to continue or to return to DOS. With a more sophisticated program, I would have used the escape option to return to the main menu.

If you skip the documentation and dive right into the program, entering client data will be challenging. The program offers no help along the way. Also, be careful when entering data. Make sure that each entry is correct before you hit Return; the program doesn't allow you to go back and review your entries before you save them.

The program can be finicky when you're entering data. You must use a consistent style. Before you sit down and enter a client list, you probably should develop a coding system. The fields you can try are producer, 3 characters; standard industry code (SIC), 7 characters; type of coverage, 6 characters; insurance company, 6 characters; and statistics, 7 characters.

The producer field generally indicates the salesperson's initials. You cannot sort it. If you're a one-person operation, however, you could use it for anything else that you can code in 3 characters or less.

You would use the standard industry code, which companies use to identify their activities, with business accounts. Since you can sort it, you could assign a set of totally different values, such as type of customer or customer number, and use the field in that manner.

The documentation suggests a code for type of coverage: the first two characters indicate the type of policy, and the last four characters signify the amount. Similarly, the documentation suggests that you make the first two characters of the insurance company's field a two-letter code

that represents the actual company writing the policy, the third character where the policy was written (in house or outside), and the last three characters anything you wish.

Finally, in the statistics, or stats, column, you could make the first four characters the insured's birth month and year, the fifth character the relationship of the person insured, the sixth character the insured's sex, and the seventh character

The real power of
EasySales Pro
comes from its
ability to rank
both sales leads
and prospects
automatically,
based on data that
you enter.



the insurance rating class. If you carefully plan how best to use the available fields, you may be able to stretch some additional versatility out of this fairly rigid program.

Next you enter the narrative information that records contact with the client. You can select one of five categories (letter, meeting, phone, to do, and done) for each entry, and the entries can be several lines.

You can maintain as many as 140 clients in a single file, and each client can have up to 99 lines of text. Using more than one disk can give you a limitless list of clients, but the program lacks utilities to

assist in merging files or archiving client data.

Execu-Record uses the *PROLOK* software security system. According to the documentation, this system lets you make backup copies. But you cannot run the backups; they are for recopying the programs onto the original disk in the event that you erase the originals. (If you damage an original beyond usefulness, you can replace it for \$20.)

An experienced user could no doubt recommend dozens of improvements for *Insurance Sales Maker*, but it does work. Despite its limitations, it keeps track of your insurance clients.

■ EasySales Pro

If your sales data management needs are more extensive, *EasySales Pro*, from Sorcim/IUS Micro Software of San Jose, California, might be the package of your dreams.

EasySales Pro has three major modules: prospects, leads, and utilities. The prospects and leads modules each manage individual customer databases; the utilities handle most of the data housekeeping chores. The prospects database lets you store very detailed customer data, and you would probably use this module to track your sales efforts on prequalified, serious customers. The leads and phone sales database stores less-detailed information; it is useful for telephone sales or screening and qualifying potential customers.

Each module can have multiple databases, and you can merge data from a leads database into a prospects database



EasySales Pro
Sorcim/IUS Micro Software
2195 Fortune Dr.
San Jose, CA 95131
(800) 227-0112, (408) 942-1727
List Price: \$495

Requires: 128K RAM, DOS 2.0, two double-sided disk drives or a hard disk.

CIRCLE 699 ON READER SERVICE CARD

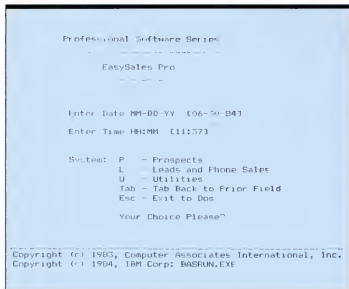


Figure 2: The first screen in EasySales Pro is a menu of the program's modules.

with the utilities module. Several different people can be engaged in prequalifying sales leads, each with an assigned database. Another possible arrangement allows salespersons to use the prospects databases and sales associates/telephone clerks to use the leads databases at the same time.

With an RGB color monitor, the easy-to-read screens are displayed on a bright blue background with white or yellow lettering. The first screen (Figure 2) is a menu that lets you choose the module to run. You must first enter the date and time. This minor step quickly becomes irritating, as every time the screen appears (when changing from one module to another, for instance), it asks you for the date and time.

Another problem with the first menu is that if you select a module that is not on the disk currently in the default drive, the software responds:

```

Program not on this disk.
Press F1 to Retry.
  
```

A more helpful response would be:

```

Insert Utilities Diskette in
Drive A:
Press F1 to continue; Esc. to
return
  
```

Instead, if you press F1, you're faced with the same menu and the same choices. At this point you're probably confused about whether changing disks is safe. The program running the first screen almost seems a quickly designed afterthought with the sole purpose of trying to tie together the main modules. Clearly, it's the weakest part of the package. But if you get past the first screen without mishap, some nice programs appear.

The prospects and the leads modules work in a similar manner, and the layouts of their screens and menus are the same, greatly aiding ease of use. A tutorial chapter in the documentation walks you through all the functions of the modules, using the actual software and the excellent test data. You can avoid both the trial-and-error method and reading the manual

from cover to cover just to get started.

A leads record has 400 characters; a prospects record has 1,900 characters. The difference in the length arises from the additional six user-defined questions and nine 120-character remarks fields in the prospects record. Accordingly, a 320K disk should store approximately 600 leads records or 120 prospects records. A 360K disk would store slightly more.

The concept of questions and answers as used by *EasySales Pro* is quite interesting. You can define both date questions and subject questions. Date questions require a date as a response to queries like "When do you plan to make your purchase?" and "When was the present equipment purchased?" Subject questions call for a narrative response; the program will store responses of up to 38 characters. Questions can include as many as 42 characters and can differ for both the leads and the sales module.

Ideally, the questions with the leads module would determine a general interest and prequalify a customer; the questions in the prospects module would determine the potential customer's exact needs and timeframe.

You can choose any of the data fields available in each module, customizing the software to meet your individual needs. You can also track sales quotas: Up to 24 sets of prospects or leads can apply against the same quota, or separate quotas can apply to each salesperson, the individual totals making up an overall quota.

The software does not analyze responses to the questions, but it does store them as a history that can be printed out, giving you an excellent narrative on current and past activity with the customer.

Beyond data storage and retrieval, the real power of the program comes from its ability to rank both sales leads and prospects automatically, as well as to determine how much time you should allocate to making a sale to an individual customer, based on the data that you enter.

Each module calculates and assigns a value to each sales lead or prospect,

HARD SELL

INKLING	Inklings Printers	Phone: 415-555-1468
Type of Business:	1400 Gutenberg St.	Contact Date: 2/ 7/84
Print Shop	San Francisco, CA 94123	
	Golden Gate County/Region	
1st Person: Fontana, William	2nd Person: Strecker, Earl	
Title: Manager	Title: Printer	
Ext: #101	Ext:	
Variance Factor: 1.0	Total Days Allocated: 11.3	Days Left: 9.3
Sale Chance: 55.0%	Order Amt: \$52,000.00	Days Used: 2.0
		Value: 727

Figure 3: EasySales Pro summarizes the variables involved in a sample sales situation.

according to such variables as the potential dollar amount of the sale, the amount of time that has been spent with the customer, the amount of quota remaining, and the likelihood of a sale. The value goes up or down depending on changes made to approximately a dozen variables. You can use this value to sort potential customers and obtain a list of your customers ranked in order of importance.

The program determines the amount of time you should spend with a potential customer, based on many of the same variables. The program warns you when you have spent too much time on a particular customer and should divert your attention to more likely prospects. You can also generate customer lists based on the number of days left to sell to each prospect.

Figure 3 is a printout of the summary report of a sample prospect called Inklings Printers. A potential sale of \$52,000 is in the works, and the salesperson reports that there is a 55 percent chance of a sale, after having spent 2 days on the customer. The program has assigned a relative value of 727; it indicates that the salesperson can spend up to 11.3 days working on the sale.

When a sale is made, the value of that sale is updated and entered into the quota information.

It's not unrealistic to expect a busy salesperson to take full advantage of the prospects module, since it produces an excellent customer history and supplies some valuable rankings. It does, however, seem unrealistic to expect an experienced, commissioned salesperson to spend much

time with the leads module, though they might consider delegating that responsibility to a subordinate in sales or to a clerk who has the role of screening possible customers.

The leads module does an excellent job of qualifying customers, and in sales, that is critical. Another important strength of the program is its ability to produce written reports. Data within the databases can be reported in many ways, giving you several different versions of the same information. The report generation capability gives you the tools necessary to manage data from an entire sales force. Clearly, a great deal of thought has gone into the design of this program, and it shows. Conceptually, *EasySales Pro* appears able to give an appropriate level of service to persons at virtually any level of sales.

The program's documentation is thorough; it takes you through each step in a fairly simple manner that doesn't assume too much technical knowledge. Unfortunately, the initialization procedure asks for information that the nontechnical user may not know or may find difficult to obtain. How many users know if their printer uses ASCII 12 for form feeds, what ASCII control sequence is required for compressed print, or the sequence to return to normal print mode?

Although the documentation states that "to take full advantage of this program, you need a printer capable of printing at least 132 characters per line," the program works well with an 80-column printer (such as an Epson) using the compressed print mode.

■ The Sales Edge

While *EasySales Pro* seems to be the ideal package for managing hard sales data, most salespeople also want to develop a certain instinct—an edge. *The Sales Edge*, from Human Edge Software of Palo Alto, California, is a package designed to help you develop that special something that often separates the top sales producers from the rest of the pack.

The Sales Edge is not a customer database in the regular sense of the word. It doesn't track names, addresses, sales histories, appointments, or any of the standard customer data. It does, however, store the personality and business traits of sales contacts, and it matches them with data from a self-assessment to develop a complete personalized sales strategy.

You are presented with a menu offering a choice of instructions, self-assessment, customer assessment, or strategy report. The instructions inform you that the package is designed to give you customized sales strategy reports based on information that you supply about yourself and about a specific customer.

The self-assessment consists of 86



The Sales Edge

Human Edge Software Corp.

2445 Faber Place

Palo Alto, CA 94303

(415) 493-1593

List Price: \$250

Requires: 128K RAM.

CIRCLE 697 ON READER SERVICE CARD

statements with which you must either agree or disagree. The questions do not have to be answered in the order in which they are given, and you can skip around or change answers as you deem appropriate. You can even take more than one session to finish the assessment; before a sales strategy can be prepared, however, you must answer all 86 questions.

You signify agreement or disagreement by using the cursor controls to highlight AGREE or DISAGREE. Typical questions in this section include:

- I like to take charge of situations.
- I would never quit one job unless I had another.
- I take more risks than other salesmen.
- I have many self-doubts at work.
- I like working alone.
- Friends consider me to be a dominant person in sales situations.
- I am troubled when someone breaks rules.
- Most accidents I have are my own fault.
- I tire easily at work.
- I like talking at company meetings.
- I enjoy "putting one over" on customers.
- A good salesperson looks out for himself first.
- I would rather take my vacation at home than travel abroad.

Only one self-assessment can be on file at a time, but you can update it whenever you desire. Available disk space is the only limit on the number of customer assessments you can store, and since you can use any formatted floppy for storage, there is no real limit. In fact, you would probably want to keep a number of customer data files, updating them when you get a better understanding of your customer's contact.

Before completing a customer assessment, you should probably meet with that customer at least once, or find out as much information as possible about the person beforehand, and complete as fully as possible one of the customer contact records

The documentation is nothing less than a mini-textbook on the concept of selling.



that come with the documentation.

A list of 104 adjectives appears on the back of the customer contact form; you check the words that describe the behavior, attitude, and "styles" of the customer. You then recheck and update the list after every meeting with the customer.

Once you have a feel for the customer's personality, you should begin (and if possible, complete) a customer assessment. In this case, you agree or disagree with the applicability of some 50 adjectives.

After you've completed both the self-assessment and a particular customer assessment, the software analyzes the results and produces a sales strategy report for that particular customer contact. The report for a fictitious customer (in which I assigned most of the personality traits of one of my neighbors), Joe Samples, and a fictitious salesperson we'll call Bill (based on my better personality traits) ran five pages.

The report begins with an interesting section called What to Expect that

describes, in personal terms, how the relationship between Joe and me (or Bill) should develop. The software advises that Joe and I should get along well, but that I should take care not to be swayed by Joe's occasional manipulations. I should listen carefully, close the sale quickly, and avoid trying to lead Joe into doing something he doesn't want to do.

Next is the How to Succeed section. It advises me that neither Joe nor I are good with details, and so although Joe might make a purchase based on my general specifications, I should make sure that my product is a good match with his needs. It also cautions me that since Joe believes that a "salesperson is out to sell him things that he neither wants nor needs," he will want to be in charge and may not disclose all his business needs.

The report goes on to give me advice under paragraphs titled: "Let Mr. J.S. be the center of attention," "Let the business facts do the persuading," and "Show a willingness to compromise."

The next major section of the report, titled Customer-Specific Opening Strategies, gives me two key points to remember in starting to do business with Joe: Joe likes to mix business with pleasure, and he is the type of person who will assess his own needs.

A portion of the report called Customer-Specific Presentation Strategies urges me to make my presentations exciting and to resolve Joe's objections and close the sale. It even gives me a methodology to use in dealing with Joe's objections. The final section, Customer-Specific Closing Strategies, offers me four specific closing strategies to seal the deal with Joe, along with descriptions of why each close will work.

The report itself is thorough and well put together, but it would not be complete without the more than 50 pages in the documentation that cover the fundamentals of selling. This section is nothing less than a minitextbook covering the concepts behind selling, the role and the job of a salesperson, and the different factors that lead

CopyWrite backs up IBM PC Software

Hundreds of the most popular copy-protected programs are copied readily. **CopyWrite** needs no complicated parameters.

Requirements: IBM Personal Computer or XT.
128k bytes of memory.
one diskette drive.

CopyWrite will run faster with more memory or another drive.

CopyWrite is revised monthly, to keep up with the latest in copy protection. You may get a new edition at any time for a \$15 trade in fee.

CopyWrite makes back up copies to protect you against accidental loss of your software. It is not for producing copies for sale or trade, or for any other use that deprives the author of payment for his work.

To order **CopyWrite**, call with your credit card or mail a check for \$50 US funds to:

Quaid Software Limited
45 Charles Street East, Sixth Floor
Toronto, Ontario, Canada M4Y 1S2
Telephone (416) 961-8243

Ask about **ZeroDisk** to run copy-protected software from a hard disk.

HARD SELL

to success. It details a seven-step selling process: prospecting for leads, preparing for a sales call, opening the sales call, making the sales presentation, handling resistance and overcoming objections, using different types of closes, and following up.

The Sales Edge worked as advertised, and no bugs appeared during testing. The software guards against incorrect keystrokes with a typical beep and a friendly message explaining the problem. On-line help is available by simply pressing F1. You use all 10 function keys, although not all can be used all the time. The bottom line of the monitor displays the currently enabled function keys. Getting the report to print is easy, and there are no choices to make that are beyond the skills of anyone who has spent at least a dozen hours using the PC. My only real criticism is that the occasional disk prompts that appear when the report is being generated do not advise you which drive to use, and this lack could cause some confusion.

The package would make an excellent training tool for junior salespeople, even those right out of college. It would even prove useful to experienced salespeople who, for example, are taking over a new territory or someone else's accounts.

The documentation is one of the package's strong points. It has been designed, illustrated, and produced well. The user manual part runs to 92 pages; it takes even an inexperienced user step by step through the software. Separate appendices cover the care and handling of disks, getting started, installing DOS on the program disk, DOS commands, function keys, salesman perception skills, a glossary of computer terms, and system error messages the user might encounter. The developers did an excellent job of meeting the needs of the novice without exhausting the patience of the experienced user.

If you are in sales, whether just learning how to sell or looking for the competitive edge, a PC and one of these sales packages on your team could help put you in the winner's circle. ■

WHY WOULD ANY SANE PERSON SPEND \$199 FOR A BetterBASIC SYSTEM WHEN DOS's IS FREE?

HERE ARE 10 REASONS:
TEST YOUR SANITY

1. Full support for 640K memory
2. Structured language with BASIC syntax
3. Separately compiled program modules
4. Speed: FAST
5. Extensibility (Make your own BASIC.)
6. User-defined procedures and functions
7. Built-in windows support
8. Interactive programming language based on an incremental compiler
9. 8087 math support
10. Runs on IBM PC, IBM PC/XT and compatibles

Summit Software
Technology, Inc.™
P.O. Box 99
Babson Park
Wellesley, MA 02157

1-800-225-5800

BetterBASIC is a trademark of Summit Software Technology, Inc. IBM PC, IBM PC/XT, IBM PC DOS are trademarks of International Business Machines Corp. MS-DOS is a trademark of Microsoft Corp.

NOW AVAILABLE FOR
THE TANDY 2000 & 1200

**Better
BASIC™**

SANE
PROGRAMMERS
ORDER
BetterBASIC NOW

Price: \$199

8087 Math Module: \$99

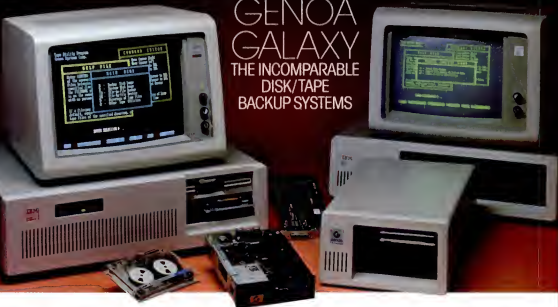
Runtime System: \$250

Sample Disk: \$10

MasterCard VISA FCI Checks,
Money Orders and
C.O.D. accepted

GENOA GALAXY

THE INCOMPARABLE
DISK/TAPE
BACKUP SYSTEMS



Check this combination of new functions, ease of operation, speed and price!

Take a close look at the comparison chart below and you'll quickly see how Genoa's unique and powerful software provides the critical elements that you've been waiting for in a hard disk/tape backup system for your IBM® PC, XT,™ AT™ and compatibles.

Multi-window, multi-function displays, including the on-line simple Help Menu, the mouse-like Command Input and the intelligent command line editor enable the average user to operate this system in an easy, straightforward manner, getting help, if needed, from the screen — not the manual. Toggling between DOS and tape menus saves valuable time in every application.

Backup 20 mb in less than 5 minutes.

The Galaxy's speed, and the combination of Backup/Restore capabilities, is unmatched by any other tape backup subsystem available today. The system is fully network compatible and easily installed in less than 15 minutes. All Genoa hard disk subsystems, whether stand-alone or in combination with tape, include the correction for DOS 2.0 problems, a media defect map on the supplied diskette, and allow you to use the entire disk under DOS 2.0, 2.1 and 3.0. In addition, Genoa offers disk/tape drive interchangeability, which enables you to backup data from one hard disk and restore to another using Genoa's proprietary software.

The Genoa product line now includes graphics controller boards as well as internal and external models of hard disks and tape backup systems — each in stand-alone or combination configurations. They are designed for use with the IBM® PC, XT,™ AT™ and compatibles.

See your local dealer or call toll free for details.

1-(800) 325-0874 Outside Calif.
(800) 824-8372 Inside Calif.

Dealer inquiries invited.



Genoa
SYSTEMS CORPORATION

73 E. Trimble Road • San Jose, CA 95131
(408) 945-9720

20 MEGABYTE HARD DISK/TAPE CARTRIDGE SYSTEMS

	Genoa Galaxy 3120	Taligent T1-5020 T1-09	Atty PC Galcator	System XL	Mosston 01-4000-03
Multi Window, Multi Function Displays	✓				
On-line Help Menu Window	✓				
DOS/Tape Utility Toggling	✓				
Mouse-like Command Input	✓				
DOS-like Tape Directory Commands	✓				
Backup/Restore Time & Percentage Indicator	✓				% only
Image Backup/File by File Restores with Directory Display	✓				✓
File by File Backup/Restores by Directory or Subdirectory	✓	✓	✓	✓	
File by File Backup/Restores by Date or Last Modified	✓	✓	✓	✓	
File by File Backup/Restores with Appending & Exclusion	✓		✓		
File by File Restores to any Directory	✓				
Warranty	1 YEAR	5 mo	90 days	90 days	6 mo
Price	\$3295	\$3144	\$4595	\$3295	\$4495

Trademarks/Owners: IBM is a registered trademark. AT and XT are trademarks of International Business Machines Corporation. Genoa Galaxy is a trademark of Genoa Systems Corporation. The comparison chart was prepared by Genoa Systems Corporation based upon information obtained from the companies named in the chart during the week of December 10, 1984.

CIRCLE 229 ON READER SERVICE CARD

EVERYTHING ABOUT YOU IS UNIQUE.

You need nothing
less than a
custom news service

From your fingerprint to your monogram, you are unique. You wear a business suit tailored just for you; now you can get business news tailored just for you. With NewsNet you get vital, in-depth business news. You get expert information on your industry or profession. Through your computer and telephone, you get news on a vast range of subjects from the world's largest retrieval service of business newsletter information.

3,000 New Articles Screened Each Day

You'll get access to more than 250 business newsletters, plus wire services like UPI and PR Newswire. There's news on everything from computers to investments, from taxes to telecommunications. 3000 new articles are added every day and each one is screened specially for you.

Fast, Versatile, Simple

You enter key words, names or phrases. NewsNet stores them and saves every article containing those words. Check in daily, even hourly; scan the headlines or read entire articles, and print out what you want to keep. Change key words when you like. You're free from the worry that you've missed something important—and your topics may turn up in publications you'd never have time to read. If you're onto a new topic, the entire NewsNet database is available for your search. Get special reports on your competition, the inside story on an industry, or press coverage of a company's new product.

Start Saving Now

The average newsletter carried by NewsNet costs \$200 per year in print form. That's \$50,000 worth of newsletters. Yet with NewsNet you pay as little as \$15 per month for access. And NewsNet has no initiation fee. It's a tremendous value. So call today. We'll send everything you need to start saving now.

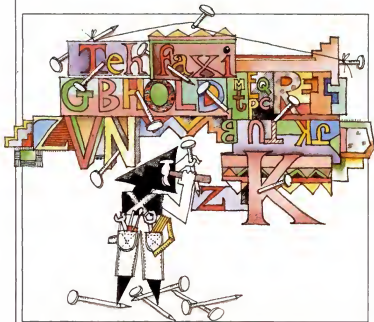
Welcome
to
NewsNet
Your Custom News
Report is Ready

800-345-1301

(In PA 215-527-8030)

945 Haverford Rd. Bryn Mawr, PA 19010

CIRCLE 370 ON READER SERVICE CARD



Put Your Text in Top Form

Highly complex text-formatting capabilities, once available only on mainframes, are being brought to the PC. The four programs surveyed here reflect these recent additions.

PC users are most familiar with the "what-you-see-is-what-you-get" variety of word processors like *WordStar*. By merging real-time on-screen formatters with text editors, these programs are a writer's workbench for polishing content and form. Word processors of this type allow you to remedy both textual and stylistic gaffes as soon as you see them and generate the final product quickly.

Although word processors like these are common today, online formatting is a relatively recent development. Word processing began on mainframes with batch formatters—programs that allowed writers to concentrate solely on the content of the input document and address the stylistic issues later, when formatting. The mainframe word processing programs that were developed then were used to generate documents that required highly complex formatting and that might have included multilevel tables of contents, multilevel indexes, running headers and footers, and footnotes.

Mainframe text-formatting capabilities have now been brought to the PC with text-formatting programs such as IBM's new *Script/PC*. You can use these programs with the text editor of your choice.

WORD PROCESSING

Using a text formatter is comparable to writing a program that lets you print a document in a variety of ways, ranging from such formats as a public relations pamphlet or a sidebar in an annual report to a postscript in a personal letter. The formatted document itself is only an abstraction—a program that imposes form on the text of your document. To produce different forms of the same document in *WordStar*, you would have to reformat the text separately for each version, checking the way it looked on the screen as you worked. Relying in this way on the computer for continuous feedback is like never taking the training wheels off your bicycle.

Since I have used text formatters on mainframes for years and have already purchased two of the products included in this survey, I was very eager to do this survey of text formatters. The availability and relatively low cost of the formatters surveyed here make it likely that high-powered programmable word processing will soon be coming to a PC near you.

PC

Script/PC, Version 1.0

IBM Entry Systems Division
Boca Raton, FL 33432
(800) 447-4700

List Price: \$275

Requires: DOS 1.x with 128K or DOS 2.x with 192K, one disk drive (two are recommended), monochrome display, IBM graphics or matrix printer, or compatible.

CIRCLE 636 ON READER SERVICE CARD

WORDIX, Version 1.31

INDIX, Release 1.0

Emerging Technologies
Consultants, Inc.

1877 Broadway
Boulder, CO 80302
(303) 447-9495

List Price: *WORDIX*, \$195; *INDIX*, \$95.
Requires: *WORDIX*, 192K; *INDIX*, 128K; one disk drive.

CIRCLE 637 ON READER SERVICE CARD

Script/PC

Although quite a respectable chunk of software, IBM's *Script/PC* is a rather late entry in the text formatter race. It has stiff competition in the likes of *WORDIX*, *ReadiWriter*, and *MicroScript*—and not only in price. In fact, nearsighted design constraints as well as manifold scheduling problems have so crippled IBM's entry that its competitors now have a surprisingly clear edge.

Script/PC is the wayward offspring of a long and honorable lineage that harks back to the late sixties, when IBM contracted Stuart Madnick of MIT to write a simple document preparation utility for its mainframes. This first version of *Script* was very near to UNIX's *roff* (for "run off") utility. Geoff Bartlett wrote the next version, called *Script/370*, at the Watson Research Labs. It was made available to IBM's customers in 1976 as a Field Developed Program (FDP), which meant that it wasn't officially supported.

By the third quarter of 1978, partly to

ReadiWriter, Version 1.23

ReadiWare Systems, Inc.
P.O. Box 515
Portage, MI 49081
(616) 327-9172

List Price: \$125

Requires: 128K with all versions of DOS, two floppy disk drives of any type or one double-sided disk drive.

CIRCLE 638 ON READER SERVICE CARD

MicroScript, Version 3.0

MicroType
6531 Crown Blvd., Suite 3A
San Jose, CA 95120
(408) 997-5026

List Price: *MicroScript*, \$50 (diskette upgrades, \$25; diskette plus documentation upgrades, \$50); *Micro Ed*, \$25.

Requires: 192K with DOS 2.0 and up; one disk drive (two recommended).

CIRCLE 639 ON READER SERVICE CARD

support IBM's new 3800 laser printer, *Script/370* had evolved into *Script/VS*, which became one of the two major components of a text formatter called *DCF* (Document Composition Facility). Through the use of improved macro facilities, a canned application was developed to consistently format IBM manuals. This macro set, called Generalized Markup Language (GML), was the other component of *DCF*. *DCF* Version 2 was made available in the first quarter of 1980, and Version 3 has just been released.

Clunky Commands

Now in its old age, *Script/VS* shows clear signs of wear. There are many new commands that could have replaced the older, more primitive ones, thus marrying power and simplicity. But to retain upward compatibility, no commands were ever deleted. As a result, *Script/VS* became a top-heavy language full of redundancy and pointless variations on a few themes.

It would have been great if GML tags had entirely replaced the awkward *Script/VS* control words, just as procedural languages supplanted assemblers in applications programming 20 years ago.

All of the other text formatters I surveyed merged the separate languages of *Script/VS* and GML into a single set of commands.

Instead, by retaining all the old *Script/VS* control words, *DCF* doubled the complexity of the user interface. *DCF*'s documenters have done yeoman service trying to make sense of it all, particularly in their assiduous concern for naming conventions. For example, *Script/VS* commands are called "control words" and accept "parameters," while GML commands are called "tags" and have "attributes."

But to really master *DCF*, you have to think on several planes of document modeling at once.

Therefore I was disappointed to find that there is no generation gap between *Script/PC* and its senile parent. By insisting on as much compatibility as possible between the mainframe and micro prod-

ucts, IBM has ensured the survival of all the maladaptive idiosyncrasies of this doomed race.

Restrictions

Script/PC has other weaknesses as well. Several features are incompletely implemented. The most annoying is that you actually have to tell *Script/PC* how many lines to reserve at the bottom of the page for your footnotes—something that computers are supposed to adjust automatically.

Also, *Script/PC* requires two passes for a table of contents, while all the other products I surveyed print the table of contents after the first pass and assume you know where it goes in the printout. With all the time it's had to think about your table of contents, *Script/PC* still requires you to tell it beforehand if it should reserve more than one page. Similar restrictions apply if you want to generate a list of illustrations.

The documentation for *Script/PC* is impressively lengthy, but it contains oversimplifications such as "symbols are nothing more than changing a temporary name to a permanent name."

And its printer support, or lack of it, is a scandal. To route output to any printer other than an IBM PC Matrix or IBM PC Graphics printer, you have to write your own protocol converter, which either traps the appropriate ROM BIOS interrupt or filters output formatted on disk.

It's a well-known cliché that IBM hardware is the best that money can buy, and its software the worst. The unmerciful crippling of *Script/PC*, through the tyranny of compatibility and the rush to market, helps explain such sentiments.

(For a closer look at *Script/PC*, see "Textual Healing with *Script/PC*" *PC*, Volume 3 Number 25.)

WORDIX

WORDIX can take the credit for being the first text formatter available on the IBM PC. (*MicroScript*, which also was released in September of 1982, was orig-

inally marketed to CP/M users.) The first release of *WORDIX* could generate tables of contents but not indexes, and because of this a lot of people who would have rushed out to get a copy decided to wait. In May 1984, a companion product named *INDIX*

Although quite a respectable chunk of software, IBM's *Script/PC* is a rather late entry into the text formatter race.

appeared, but unfortunately *INDIX* does not seem to be well designed. *INDIX* and *WORDIX* are also available as part of ETC's Professional Writer's Package, which includes *EDIX*, a text editor, and *SPELLIX*, a spelling checker.

WORDIX's familiar advertisement looks great until you discover that not all of what you see is completely automatic. Believe it or not, *WORDIX* doesn't automatically number footnotes for you. If you never have more than one footnote per page, you can use an asterisk rather than a number, but who wants to live with that constant restriction?

While using *WORDIX*, I found that it seems to have some arbitrary requirements even more annoying than those of *Script/PC*. For example, the current drive must be writable if you want to generate multicolumn output.

Error recovery also leaves much to be desired. When I misspelled the tag that ends a footnote, all subsequent output backed up and I got an "Out of memory" message. Since *WORDIX* doesn't flag unrecognized tags, I was left with no clue as to just which tag caused the problem. Also, when my output disk was full, *WORDIX* terminated clumsily: According to CHKDSK, it lost 19 clusters of 5 chains.

(continued)

Benchmark Test Results

Here are the times each of the four programs took to format a business proposal about 25 pages long.

To measure the speed of our four text formatters, I used a business proposal I wrote that included a table of contents, three embedded chapters with section headings and footnotes, and an index. It included one page cross reference to a previous page in Chapter 2, but nothing that logically made two passes necessary.

It took a day to convert four copies of the input documents to call up tags appropriate to a different formatter. Each version of the main file averaged 1K, and the chapters came to roughly 11K, 9K, and 8K apiece. The formatted document

was about 25 pages in length.

In each case, the input was read from and the output written to the same floppy diskette. The elapsed times were:

Minutes:Seconds

<i>Script/PC</i>	17:30
<i>WORDIX+INDIX</i>	10:15
<i>ReadiWriter</i>	9:00
<i>MicroScript</i>	2:15

In a sense, the times for *Script/PC* are unfair because it unnecessarily performed two passes of the input file. But this injustice is certainly greater to the user than to the product.—D.H.

Announcing
the sudden obsolescence
of the floppy disk.

NEW



HELIX PC BUBBLE DISK™

HALF-MEGABYTE MEMORY BOARD

The first bubble memory board for
IBM PC/XT and compatible computers.

- NON-VOLATILE: You don't lose data when there is no power.
- Eight times faster than a floppy disk.
- For fixed or portable use without need for back-up storage.
- Impervious to dust, dirt, humidity, cold—as reliable in the North Sea, the Sahara, a Space Station, as in your office.
- Mean time between failure (MTBF) more than 20 years.
- Rugged enough to withstand vibration and shock up to 200Gs.
- For complete details, contact HELIX



Helix Laboratories, Inc.
8123 Remmet Ave., Canoga Park, CA 91304
(818) 710-0300—outside California, 800-468-0004
Dealer Inquiries Welcome

CIRCLE 247 ON READER SERVICE CARD

© 1984, Helix Laboratories, Inc.

WORD PROCESSING

WORDIX has one feature that I much admire: It's the only formatter in this survey that does automatic hyphenation. In fact, it uses the hyphenation algorithm described in Appendix H of *TEX & METAFONT* by Donald E. Knuth (Digital Press, 1979).

WORDIX Release 1.31 can't use more than 192K, but neither can it get by with much less. It performs microjustification for monospace fonts only. Release 2.01, which became available in July 1984 and requires 192K, supports microjustification of proportional fonts. Since it can't use more than 192K (memory will be expanded with the next update) and is larger than Release 1.31, you'll have less space for macros and diversions. Release 2.01 also has path support, and 1.31 owners can get it for only \$25.

The basic design flaw in **INDIX** is that it works off the formatted output from **WORDIX** rather than from your input document.

The **WORDIX** manual, not surprisingly, has no index. The **INDIX** manual does, but not to the **WORDIX** manual. Both manuals seem obsessed with pushing ETC's other products, and some parts of the **WORDIX** manual apparently haven't been updated for years. For example,

you'll read in the appendix, "If at all possible, you should use version 1.10 of DOS."

Nonetheless, you can't wade through the **WORDIX** documentation without wanting to give its authors an A for effort, and in 1982 this product was definitely a contender. The addition of **INDIX**, though, was hardly an improvement.

The basic design flaw in **INDIX** is that it works off the formatted output from **WORDIX** rather than from your input document. Even if you do find enough disk space for the **WORDIX** output, you must specify a dummy printer personality file because according to the documentation, "most printer personality files put lots of strange printer control characters in the file. These might confuse **INDIX**."

Then, of course, you'll have to go back a second time and run **WORDIX** with the right printer personality file. And finally, you have to take the output from **INDIX** and—you guessed it—run it through **WORDIX**.

INDIX doesn't merely insert entries into an index. If you specify an Include file, all references to the included words or phrases will be found and indiscriminately indexed. Or, you can specify an Exclude file and index every single word in your document *except* those excluded. The include and exclude features sound powerful and certainly chew up CPU cycles, but when was the last time you actually saw an index created by such a shotgun approach?

Since **WORDIX** automatically hyphenates words, **INDIX** naturally has to go and unhyphenate them to find out whether they are in the Include file and should be indexed. This process works well when it restores "mo-ther" to "mother," and not at all well when "mother- in-law" becomes "motherin-law."

Naturally, it wouldn't do for **INDIX** to scan the running headers and footers for terms to index, so you have to explicitly tell it where on a page it can look. In fact, you have to specify about a dozen page layout parameters right on the **INDIX** com-

Bloops and Blunders

Each of these text formatters has a few tragic flaws, some so cludgy that they deserved mock awards.

To IBM, Inc.:

- For making the user tell the computer how many lines to reserve at the bottom of a page for footnotes. This is something a computer is supposed to do.
- For forcing the user to print the table of contents before the body of the document, thus requiring a time-wasting second pass.
- For making the user figure out how many pages the table of contents requires, even though the computer has two passes to do it in.
- For not automatically numbering footnotes.
- For not automatically numbering chapter or section headings.
- For supporting no printers other than the IBM PC Matrix and IBM PC Graphics printers.

To ETC, Inc.:

- For failing to number footnotes automatically. IBM's similar omission is no defense.
- For not allowing ordered lists to be nested.
- For making diversions so treacherous that you now have to think like a computer in order to use one.
- For failing to provide a viable index-generating program.

To ReadWare Systems, Inc.:

- For not letting IF/THEN/ELSE and WHILE/WEND constructs span more than one line.

To MicroType:

- For having developed the most elegant product by far, but not quite the most powerful one.—D.B.

WORD PROCESSING

mand line, and that means that your document is now restricted to a single-page format no matter how many chapters and appendixes and figures it has.

To cap off all this silliness, ETC then has the gall to imply that you might want to use *INDIX* even if you weren't strapped to *WORDIX*. On page 25 of the *INDIX* manual, it admits only that "if you are using *WORDIX*, then you are in luck." But on page 44 it gives you the following instructions to the not-so-lucky: "You will probably have to eliminate underlining, emboldening, superscripts and subscripts, microjustification, and proportional spacing from the document in order to minimize the printer control information and non-ASCII codes. Nevertheless, the pagination must exactly match the pagination of the final, printed document."

It may be easier to prepare your index on a 1953 Underwood typewriter.

ReadiWriter

Since I had spent several years using *Script/VS*, you can imagine my excitement when a product explicitly supporting GML tags appeared early in 1983. I had been planning to buy *WORDIX*, but chose *ReadiWriter*, which was designed as an implementation of *DCF* for the IBM PC, because of its close similarity to its mainframe cousin. In the first month after buying it, I easily prepared a business proposal consisting of three chapters with footnotes, a table of contents, and an index. (This is the document I used for the benchmark tests shown in the sidebar "Benchmark Test Results.")

Actually, *ReadiWriter* improves considerably on the *Script/GML* dichotomy by providing a unified syntax for tags. For backward compatibility, though, a special "script" mode is provided. One improvement I like is *ReadiWriter's* :SET command, which controls most of the environmental variables, including page layout. Also, any :SET operand can be read out and used in macros. The value of the "linelen" parameter, for example, resides in "&Slinelen".

After 6 months of heavy *ReadiWriter* use, I got restless—partly because promised enhancements weren't being delivered, but mostly because I expected an imminent IBM offering to be superior. Working with the other products in this survey, however, has given me new respect for my first choice. Contrary to my expectations, *ReadiWriter* has turned out to be the most powerful and flexible of all text formatters now available for the PC.

Consider the index, for example. Only in *ReadiWriter* can you get two levels of indexing, as well as "see" and "see also" references, as in:

text editors, see "editors, text"
text formatters,
 see also "word processors"
 MicroScript, 149, 167, 188
 ReadiWriter, 239, 241, 401
 Script/PC, 89, 539
 WORDIX+INDIX, 140, 143

Only in *ReadiWriter* can footnotes be automatically numbered and overflow sent to the bottom of the next page when there is no more room on the current page. Only *ReadiWriter* allows endnotes (notes saved for the end of a chapter) and footnotes in the same document. Only *ReadiWriter* beeps for your attention when I/O errors occur, allowing you the choice of specifying a different file, swapping diskettes, or simply stopping. All of its features work intelligently and in harmony with the overall design, and it imposes no obscure restrictions to remember. The level of professionalism in *ReadiWriter's* implementation makes *WORDIX* and *Script/PC* look like they've been tossed off by opportunistic amateurs.

Unfortunately, *ReadiWriter's* macro language is not simple, and its limitation that conditionals can't span more than one line turns out to be extremely clumsy—it means you must store the conditional instructions in an external tag, causing unnecessary and oft-repeated I/O.

ReadiWriter, alone among the formatters in this survey, includes a free text edi-

tor, naturally called *ReadiEdit*. This editor is a productive subset of IBM's Personal Editor and, while no match for the original, will be a blessing to anyone still struggling with EDLIN. *ReadiWare* Systems, Inc., also sells *ReadiTerm*, a communications program, and *ReadiScope*, a diskette analyzer that has earned good marks in these pages.

ReadiWriter's documentation is probably more complete than that of the other three products I reviewed, although the arbitrary division between ordinary and advanced topics makes it difficult to find things when you're in a hurry.

So far, only about 1,000 copies of *ReadiWriter* have been sold, a sales result that puts a crimp into product development. For a long time, *ReadiWare* Systems has wanted to rewrite *ReadiWriter* in C and to

ReadiWriter has turned out to be the most powerful and flexible of all text formatters now available for the IBM PC.

support multiple columns. Neither enhancement seems to be in the works.

ReadiWriter is written in compiled BASIC, so it doesn't support paths, and it can't take advantage of more than about 128K. But it never seems to run out of memory and is compatible with all releases of DOS. Upgrades cost only \$20 and are worth it.

ReadiWare Systems says that box support is coming but claims that I'm the only one who's ever asked for multiline conditionals or multiline in-stream tags.

MicroScript

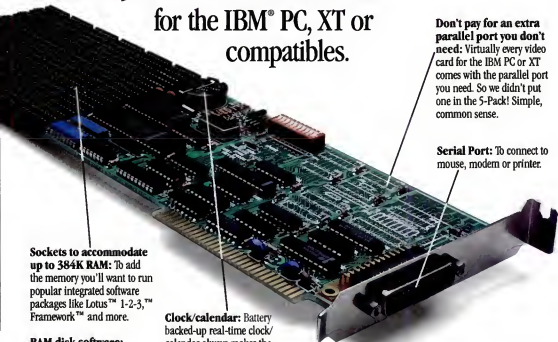
Some of the best microsoftware companies these days seem to be one-person

\$229.

The object of Paradise™ engineering: More performance for the dollar.

Paradise engineering means no compromises. From the people who revolutionized graphics on the PC. Here it is: The functions you want. The quality you need—at a price you can't beat.

The New 5-Pack™ Multifunction Card for the IBM® PC, XT or compatibles.



Sockets to accommodate up to 384K RAM: To add the memory you'll want to run popular integrated software packages like Lotus™ 1-2-3™, Framework™ and more.

RAM disk software: Designate some RAM as a disk drive and watch your programs fly.

Print spooler software: So you can work while your printer is printing. Timesaver!

Clock/calendar: Battery backed-up real-time clock/calendar always makes the exact time and date available to you and your system.

Full one-year warranty: We don't compromise on quality, so there is no need to compromise on warranty. Thoughtful engineering and volume production mean lower manufacturing costs to us—and savings to you.

Don't pay for an extra parallel port you don't need: Virtually every video card for the IBM PC or XT comes with the parallel port you need. So we didn't put one in the 5-Pack! Simple, common sense.

Serial Port: To connect to mouse, modem or printer.

Tear this ad out. Take it to your IBM dealer and compare Paradise to any other multifunction expansion card.

You'll see why the 5-Pack is measurably the best

engineered deal on the market today. (If your nearest dealer is out of stock, call us right away!) **1-800-527-7977, In CA: 1-800-822-2020 (Dept. 156)**

IBM is a registered trademark of International Business Machines Corporation. Trademarks: Paradise, the Paradise logo, Paradise Systems, Inc. Lotus 1-2-3, Lotus Development Corporation, Framework—Allison Tate.

PARADISE SYSTEMS, INC.
150 North Hill Drive • Brisbane, CA 94005 • (415) 468-6000

PARADISE

You can measure it.

No matter which computer you use...



WE COVER ALL SYSTEMS AND THEIR NEEDS.

Every month CREATIVE COMPUTING brings you the information you need to expand the functions of your system—any system—without any bias.

CREATIVE COMPUTING goes beyond machine specific magazines, providing you with a vital exchange of ideas and insights from all the world's leading computer manufacturers, as well as the technological innovators entering the marketplace.

Whether you're expanding your system with new hardware, software, or add-ons, you need all the information available—and we deliver just that!

If you're upgrading with memory boards, CREATIVE COMPUTING will help you choose the ones that meet your needs and budget!

When you're using word processors, we provide you with

thorough reviews on software and new innovations—with hands-on tips you can apply!

And if you need more information on color monitors or printers, you can depend on CREATIVE COMPUTING for a complete comparison—for all systems!

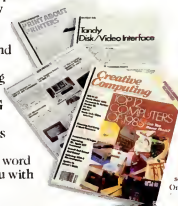
No matter which computer you use—Apple, IBM, Atari, TRS-80, or any other system—we can tell you what's new and available for you to expand your system—any system!

Stay in the know and make the most out of your computer!—Enter the CREATIVE COMPUTING \$5,000 SWEEPSTAKES!

Return the entry card today and you may win \$5,000 in software, hardware and peripherals to build your dream system!

Guarantee the best performance from your system and subscribe to CREATIVE COMPUTING today and **save up to 50%!**

No purchase necessary. If card missing, send stamped, self-addressed envelope to: CREATIVE COMPUTING, One Park Avenue, Room 442, New York, NY 10016 for information



operations. MicroType is one of these. It's two products are *MicroEd*, a text editor, and *MicroScript*. Tim Tetiva, its president and only employee, is a former IBM'er who, although shy about discussing his impressive programming credits, warms up when discussing text-formatting technology.

MicroScript is small, fast, cheap, and powerful—and easily extended with user-

defined macros. The company decided early in its design to break away completely from the *Script/VS* model. Anyone who needed *Script/VS* compatibility would be foolish not to buy the PC product, so why should MicroType compete in a market in which it can't win?

When I purchased *MicroScript* last May after a half-hour chat with its author, I was immediately struck by the deep beau-

ty of its design. It has significantly fewer commands than any of its competitors, yet those commands provide a full 90 percent of the power of *ReadiWriter*, the most powerful text formatter reviewed here. In fact it does a few things that *ReadiWriter* can't, including multiple columns, multiline headers and footers, indentation for n lines after n lines, and multiline in-stream tag definitions. The product has no silly bells or whistles, and it performs like clockwork.

Purchasers of either *MicroEd* or *MicroScript* get Tetiva's home phone number. If you find a bug—or even an "inconsistency"—you'll find a free fix on diskette in your mailbox within a week. In a spirit of scientific inquiry, the company seems eager to discuss all aspects of *MicroScript*'s internals, and to mention the far-flung future of word processing technology.

In *MicroScript*, anything that isn't text is called "mark up" and is enclosed in angle brackets such as:

```
<double>
```

which establishes double spacing. In most cases, these tags can appear anywhere in the line, but there are some annoying exceptions. The footnote-start tag must always appear to the right of text, believe it or not.

Luckily, conditionals can appear outside macros and are block structured. For example, a conditional such as:

```
<if &product eq
  'Script/VS'>
  This product is by IBM.
<else>
  This product is not by IBM.
<endif>
```

will output different sentences depending on the value of the variable "&product".

Unique among our four products, *MicroScript* allows five different measures of horizontal and vertical spacing: inches, centimeters, millimeters, points, and line spaces/character widths. The last

Wishlist

Features now used on mainframes could be adapted in the next generation of formatters for the PC.

To give you an idea of what text formatters are capable of, imagine you're specifying entries for an index. With IBM's mainframe text formatter, *DCF (Document Composition Facility)*, you can:

- Specify up to three indexing levels.
- Specify starting and ending page ranges for a single index entry.
- Specify that a certain page reference for an index term be shown before any of the others to indicate its relative importance.
- Specify a location other than the current page number; for instance, "see attached Auditor's Report, page 33."
- Refer the reader to another index term instead of the current page number; as in "circular definition: see definition, circular."
- Fold case-differentiated entries into one; for example, "Man" and "MAN" could appear under the entry for "man."
- Specify characters to be ignored in sorting the index, so that, for example, by ignoring periods, ".TAG" could appear after "table of contents."

With stuff like this already history, it's not at all outrageous to look for most of the following features in the next gen-

eration of text-formatting systems:

- A one-pass table of contents, with format options and selectable heading level inclusion.
- Multiline highlightable running headers and footers;
- Multiline chapter and section headings, with automatic numbering selectable by level;
- Multiple-column support with optional column balancing at the end of each chapter;
- Justified, ragged right, or ragged left paragraphing, with selectable hyphenation algorithms and exception table support;
- Footnotes and endnotes, with automatic primary and secondary page space allocation and distinct line spacing, page width, and other settings;
- Multiple multilevel indexes, with both automatic and programmable page range entries, "see" and "see also" references, single or multiple column options, and sort control;
- Macro support modeled after a procedural block-structured language like Pascal or C, with local, global, and system variables, programmable rescans, and interlanguage communication support for database access.—D.H.

JUNIOR ACHIEVEMENT

Quadram introduces enhancements that turn your PCjr™ into a powerful business computer.

Increase system power with added memory. Add memory to your system with the optional Quadjr.™ Memory Expansion Board. For memory expansion in 64K increments from 128K to 384K.

Quadjr. Expansion Chassis™ doubles PCjr power. Beginning with a 360K 5¼" floppy drive. Lets PCjr run most PC business software—including Lotus 1-2-3, Symphony, Electric Desk, and many more.*

Snap on more system features. The side unit adds a parallel port for all your printer needs. An automatic clock/calendar to date your files. A PCjr/PC mode toggle switch. Even a PCjr bus extender for future growth.

A powerful personal computer... Quadjr. Expansion Chassis blends into your system, virtually giving PCjr the power of a regular IBM PC. At over \$1,000 less than what a similarly equipped PC costs.

More PCjr expansion with QuadMEMjr.™ For home or office expansion, snap on QuadMEMjr. for 128K, 256K or 512K additional RAM.

...and Quadboardjr.™ For increased performance snap on Quadboardjr. Add 128K to 512K RAM, a parallel printer port, and a clock/calendar.

QUADRAM 
An Intelligent Systems Company

4355 International Blvd./Norcross, Ga. 30093
(404) 923-6666/TWX 810-756-4915 (QUADRAM NCRS)

CIRCLE 486 ON READER SERVICE CARD

IBM PC and PCjr are registered trademarks of International Business Machines Corporation.
*1-2-3 and Symphony are trademarks of Lotus Development Corp.
Electric Desk is a trademark of Alpha Software, Inc.

WORD PROCESSING

is the default when a parameter is an absolute or relative number. The others are selected when the number is immediately followed by an *i*, *c*, *m*, or *p*.

Most of *MicroScript*'s generic printer support is provided by "generic attributes." Generic attributes 1 through 6 can be associated with arbitrary printer control strings that start and stop a given feature. Calls to generic attribute starting and stopping macros can then be contained in your own mnemonic macros.

Unlike printer start and stop codes manually inserted in your input document, *MicroScript*'s generic attributes are not counted in space allocation; instead, they are automatically turned off at the end of a line and back on again at the beginning of the next line. By contrast, *ReadiWriter*'s scheme, which allows assignment only to prenamed variables such as `&$bold` (start boldface) and `&$ebold` (end boldface), is less open-ended.

MicroScript is written in C and uses the *CI-86* compiler. It requires DOS 2.x and 192K. Since it uses the small storage model, it can use only 192K.

Coming Attractions

The next release of *MicroScript* ought to strengthen its indexing capabilities. Currently the weakest link in its feature menu, these look pale besides those of *ReadiWriter* because when over 30 characters are truncated, only one index level is supported, there is no "see" or "see also" support, and page references to identical terms are neither gathered into one entry nor sorted correctly.

MicroType predicts that the next release will include multiple index levels, index entries longer than 30 characters, and *WHILE/WEND* programming support; an optimized driver for Hewlett-Packard's laser jet printer is coming soon.

MicroType provides diskette upgrades for \$25 and diskette plus documentation upgrades for \$50—the price of the original product. If \$50 sounds as modest to you as it does to me, throw in another \$25 and get *MicroEd*, too. ■

Daddy, where do microcomputers come from?



Two informative books to teach your child about the family computer

Growing up in the computer world will be easier if your child understands computers. And there's no better place to start than with the computer that's in your home—and with the help of these two delightful books.

Katie and the Computer and *Computer Parade* read like children's story books. Yet each one actually teaches the basics of computer operation.

Katie and the Computer traces the fantastic journey that takes place after Katie falls into her family's new computer. Once inside the computer, Katie finds herself in the imaginary land of Cybernia where she meets Colonel Byte. The Colonel guides her on a fulfilled journey that parallels the path of a computer com-

mand. Supplementary information helps children relate the story to the actual computer.

Computer Parade is the second book in the *Katie and the Computer* series. This time Katie and her brother arrive in Cybernia just in time for a computer parade—and to learn how computer music is made. All along their fanciful journey, the threesome encounters friendly and ferocious dragons, computer bits, eels and aaks. And of course they're always on the lookout for program bugs.

Any youngster age 4-10 will delight in these books. They're easy to read and richly illustrated in full color.

Help your child grow up computer literate by ordering your copies now.

MAIL TODAY TO:

CREATIVE COMPUTING PRESS

Dept. NH3B39 East Hanover Avenue, Morris Plains, NJ 07950

Please send me _____ copies of *Katie and the Computer* at \$8.95 each and *Computer Parade* at \$9.95 each, plus \$2.00 shipping & handling per book. Total Amount \$ _____

- ☐ Payment Enclosed (CA, NJ and NY State residents please add applicable sales tax.)
☐ Charge my: ☐ American Express ☐ MasterCard ☐ Visa

Card # _____ Exp. _____

Signature _____

NAME _____ (please print)

ADDRESS _____

CITY _____

STATE _____ ZIP _____

*Outside U.S., add \$3 for shipping and handling.

- ☐ Check here to receive a FREE catalog of computing books, magazines and guides.
Also available in your local bookstore or computer store.

**For Faster Service,
PHONE TOLL FREE: 800-631-8112**

(In NJ only: 201-540-0445)

ORDER DESK ONLY
(800) 292-3360
TOLL FREE IN CALIFORNIA

ORDER DESK ONLY
(800) 292-3360
TOLL FREE OUTSIDE CALIF.

Specializing in
Corporate Accounts

MC-P APPLICATIONS, INC.

The Best Computer Solution

The Best Prices - Best Service - Best Technical Support

SOFTWARE

SPREAD SHEETS	
Lotus 1-2-3	\$299
Symphony	425
Framework	372
Multiphan	135
Open Access	369
TK Solver	265
Supercalc III	245
Visicalc IV	157
Design Manager	475

DATA BASE	
dBase II	279
dBase III	372
RBase 4000	289
Knowledgeman	
w/K paint & K graph	295
Powerbase	275
Friday	195
Quick Code	
& Dutil Pak	185

UTILITY	
My desk	175
Peter Norton Utility	55
Prokey	87
Sideways	45

COMMUNICATION	
Microsoft Crosstalk	115
Smartcom II	109
Transporter	205

PROFESSIONAL	
Desk Organizer	195
Harvard Project Manager	275
Real Estate Analyzer II	175

COMPILERS	
Cobol Compiler	485
Fortran Compiler	245
Lattice 'C' Compiler	325
Microsoft 'C' Compiler	325
Microsoft Pascal Compiler	215
Macro Assembler	65
Digital C Basic Compiler	375
Pascal MT and CPM186	255

FINANCIAL	
Howardsoft/Tax Preparer IBM	219
Home Accountant-Apple	49
Personal Investor	135
Accounting Plus	
GL, AP, AR, PR, INV Each	399
State of the Art	
GL, AP, AR, PR, INV Each	485
Peachtree GL, AR, AP Each	475
Think Tank	125
Data Cell II (Tax Preparer)	1125

WORD PROCESSING	
Bank Street Writer IBM	55
Edix/Wordix Each	129
Peach Text 5000	245
Pfs: File	84
Pfs: Report	79
Multimate	275
Volkswriter Deluxe	162
Word Perfect	275
Wordstar 2000	295

NATIONAL SALES

MC-P

APPLICATIONS INC.

1630 Oakland Road,
Suite A114

San Jose, CA 95131

U.S.A.

Telephone: (408) 293-3360

Telex: 821 396.MCPA UD

RETAIL OUTLETS

Pick 'N Pay Software

San Jose, CA

Telephone (408) 293-3360

Pick 'N Pay Software

Phoenix, AZ

Telephone (602) 285-1700

MC-P International Sales Offices

AUSTRALIA	02-929-8468
NEW ZEALAND	09-34545
HOLLAND	020-268829
SAUDI ARABIA	02-660 9684

ORDER STATUS AND

TECH. SUPPORT — CALL

(408) 293-3360

PLEASE CALL FOR
HARDWARE & SOFTWARE
NOT LISTED THIS AD

INTERNATIONAL DEALER
INQUIRIES WELCOMED

TERMS: All prices subject to change without notice. Payment by cashless check/MO/bank transfer. Please allow approximately one week shipping delay for clearance of personal or company checks. California residents add sales tax. For non cash sales please add 3% handling charge.

SHIPPING: Add \$5 per item for UPS Surface, \$10 for UPS Blue Label. For Monitors add \$20 and Printers \$25 for shipping within continental U.S.A.

HARDWARE

COMPUTERS	
IBM PC 2 Teac DD. 256K	\$1595
IBM PC/XT 256K	3395
IBM Portable	2195
Apple IIc 128K, 1 Dr., Mont	1145
Apple IIe Prof Pak	1495
Macintosh	1795

DISK DRIVES	
Teac Half Height	155
Tandon 100-2	165

HARD DISKS	
Tall Grass 20 Mgb w/tape	2495
Pegasus 10 Mgb (Internal)	845
Omega 10 Mgb	2295
Everex/Cogito 10 Mgb	895

PRINTERS	
Epson FX100	645
IBM Parallel Printer Cable	25
LQ 1500 w/Tractor & Printer	1295
NEC 3550	1445
Okidata 92P w/Plug N Play	395
Qume 1140 plus	1435

MONITORS	
Amdek 12" 310A	169
Amdek Color 710	625
Princeton RGB Hi-Res 4X-12	485
IBM Monochrome	235
IBM color	565

MODEMS	
Smart Mod. 300	245
Smart Mod. 1200	495
Smart Mod. 1200B	419
J-Cat	99
Smart Cat 103	169
Smart Cat 103/212	425

HARDWARE & PERIPHERALS	
Megapius 64K	265
Six Pak Plus 64K	265
Quadboard II 64K	285
Orchid Blossom 54K	255
64K Ram Chips	40
Tecmar Graphics	495
Hercules Graphics	335
Plantronics	395
STB	335
Intel 80/87 Chip	155
Orange	94
Peach	64
Irma Board	895
Compuguard	call
Kraft Joysticks	35
TG Joysticks	35
Hayes Mach III Joysticks	39
PC Mouse w/Software	165

NETWORK	
Orchid PC Net	345
PC Net w/Blossom	525

COMMUNICATIONS	
AST 3780	695
AST 5251	575
CIRCLE 290 ON READER SERVICE CARD	

BUILT-IN PIN FEED
FOR CONTINUOUS
FORMS PRINTING

OVER 500
INTERCHANGEABLE
DAISY WHEELS
AVAILABLE

AUTOMATIC
SHEET FEED
BUILT IN

SHORT
PAPER PATH
INCREASES
RELIABILITY

COMPATIBLE WITH IBM PCs, AS WELL
AS WITH MANY OTHER MICROCOMPUTERS

The new IBM Wheelprinter: A simpler path to letter quality.

The new IBM Wheelprinter is a personal computer printer with a simplified approach to paper handling.

This new IBM personal printer is the only daisy wheel printer that offers both a built-in sheet feed and pin feed capability. It's the latest example of IBM's expertise in the design and manufacture of reliable paper feeds.

Because it has a paper tray capacity of 100 sheets, large jobs can be printed without reloading. And, at the flip of a

switch, you can go from automatic to manual sheet feed.

The Wheelprinter prints quietly on plain paper, letterhead, multi-part forms and even envelopes at up to 25 characters per second. And you can easily attach it to IBM personal computers and to many other microcomputers.

The Wheelprinter is just one example of the more than 70 printer models we build. But they all serve a single purpose: To make your printing as effective as your

processing. To give your work the finishing touch.

Contact your IBM marketing representative or call 1 800 IBM-2468, Ext. 141/3W, for the IBM Product Center or authorized IBM dealer nearest you.

IBM

CIRCLE 162 ON READER SERVICE CARD

IBM PRINTERS

The Finishing Touch

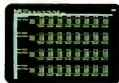
At last...Integrated Software, graphics, 132-column* display, expandability and much more for your IBM® Monochrome**...on an integrated board: UltraPAK™

Now PC/AT compatible!

Ashton-Tate™ Framework™



Lotus™ 132 Column



Color graphics on monochrome display



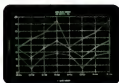
Lotus™ Symphony™



80/132 column VT100 Emulation



Lotus™ Graphics



UltraPAK™...Suggested Retail Price...\$680.
Call us for dealer nearest you **UltraPAK-S™******\$545.

Introducing the only board that does it all for your IBM PC™. In one slot. At low cost. The UltraPAK™: it's everything you ever wanted for your PC.

The powerful new generation of integrated business software requires much more than just an off the shelf IBM PC. UltraPAK™, from Tseng Labs, delivers everything else you, the business and professional user, need to fully support the new integrated packages like Symphony™, Framework™, and more. Graphics, Word Processing, Spreadsheet, Communications, Database... UltraPAK™ meets the hardware requirement head-on, and is truly in a class by itself as the first "integrated enhancement board". Compare for yourself!

Systems Supported: IBM PC, IBM PC XT, IBM PC/AT, ITT XTRA™, Sperry™, Eagle PC™, TAVA™, Leading Edge™.

With Amdek 310A Monitor: Corona™, AT&T™, Compaq Portable™, Eagle PC Spirit Portable™, IBM PC Portable.

*Multiplan™, Word Star™, Word Perfect™, with FREE 1-2-3 driver for 132 column. **IBM PC Compatible. ***UltraPAK-S, serial port and battery backed clock not available.

Lotus, 1-2-3 and Symphony are TM of Lotus Development. PC is a registered TM of IBM. Framework is a TM of Ashton-Tate. Multiplan is a TM of MICROSOFT. Wordstar is a TM of MICROPRO Int'l. Wordperfect is a TM of Satellite Software Int'l.

SINGLE BOARD COMPARISON

Integrated Applications	UltraPAK Integrated Board	IBM Monochrome Board
Graphics	720x348 Bit Mapped (2 page) Color Graphics Emulation on Monochrome Display	NA
Spreadsheet	80 Characters x 25 Lines 132 Characters x 44 Lines	80 Characters x 25 Lines NA
Communications	2 Serial Ports (1 Std. 1 Optional) connect modem, mouse, 1 Centronics Parallel Port (incl. print spool)	NA 1 Centronics Parallel Port
Word Processing	IBM Compatible	Standard
Database	Optional 384K System Memory Optional IBM Disk Controller Ram Disk Software	NA NA
Clock/Calendar with battery	Standard	NA

USER EXPANDABLE (one Option per UltraPAK board)

384K Memory	Optional	NA
IBM Disk Controller	Optional	NA
UltraPLOT™ Graphics Software	Optional	NA

Distributed By:
Compuserve (Canada).....(416) 477-8088
F.A. Components.....(800) 847-4148
Information Management Assoc.....(703) 771-6464
Manchester Equipment.....(212) 895-4404
MBS (England).....(07535) 66171
Micro Brokers.....(201) 766-5139
MICRO D.....(800) 854-6801
Micro Distributors.....(312) 843-0567
Micro Environments.....(404) 662-0744
Steinmetz Elektronik (Germany).....(089) 806061
Warehouse 1.....(800) 253-5330



Tseng Laboratories, Inc.

205 Pheasant Run, Newtown Commons, Newtown, PA 18940
(215) 968-0502 TELEX 705179

Enhancement technology for personal computers.

CIRCLE 540 ON READER SERVICE CARD

Modest Investments Yield Large Returns

Whether you're a bull or a bear, low-cost investment programs will leave some money in your pocket while helping you to analyze the market and track your investments.

Most investment software is expensive. It almost seems as if companies that sell software designed for investors think that if you have enough money to risk on the stock market, you'll be willing to spend it on costly software first. But the high prices discourage many investors who use computers for purposes other than investing from using their PCs to analyze securities and track stock portfolios. Some attractive alternatives, however, are available to budget-minded investors with PCs. And you won't have to spend hundreds of dollars on the packages, either. After all, the less money spent on software, the more you have to invest.

Plain Vanilla Portfolio System and *Net Worth* give you instant information on

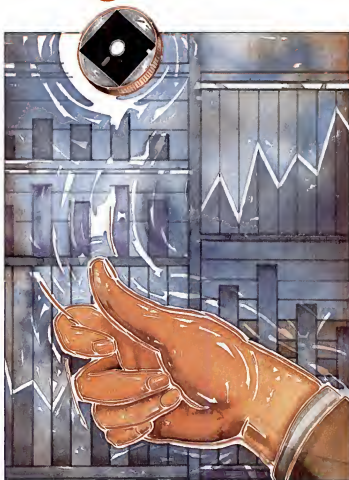


Illustration: Frank Connor

MODEST INVESTMENTS

PC
1984

Plain Vanilla Portfolio System

Iris Communications, Inc.
660 Newport Center Drive, Suite 750
Newport Beach, CA 92660
(714) 720-0800

List Price: \$79.95

Requires: 64K RAM, one disk drive.

CIRCLE 640 ON READER SERVICE CARD

Net Worth

Bullish Investment Software

P.O. Box 853
Mansfield, TX 76063
(817) 473-9249

List Price: \$59.95

Requires: 64K RAM (13 weeks for 50 securities, 10 precious metals, 20 cash assets) or 128K RAM (52 weeks for 100 securities, 20 precious metals, 40 cash assets), two disk drives.

CIRCLE 641 ON READER SERVICE CARD

Technical Indicator Program

Investment Software

P.O. Box 2774
Durango, CO 81301
(303) 563-9543

List Price: \$69.50

Requires: 96K RAM with DOS 2.0, one disk drive, graphics monitor.

CIRCLE 642 ON READER SERVICE CARD

The Evaluation Form, Version 2.0

Investor's Software

P.O. Box N
Bradenton Beach, FL 33510
(813) 778-5515

List Price: \$100

Requires: 64K RAM, one disk drive.

CIRCLE 643 ON READER SERVICE CARD

Stockfocus, Version 1.3

Centennial Software, Inc.
1873 S. Bellaire St., Suite 510
Denver, CO 80222

(303) 691-5586

List Price: \$59.95

Requires: 64K RAM, one disk drive.

CIRCLE 644 ON READER SERVICE CARD

TAX-YEAR PROFIT/LOSS INFORMATION

FOR:
THOMAS MEYERS
P.O. BOX 23456
LOS ANGELES CA 90028
070-78-1234
TAX YEAR: 1984

DATE OF PRINT: 09/28/84

PURCHASE DATE	NUMBER OF SHARES	PURCHASE COST	SALE DATE	TOTAL PROCEEDS	NET LONG TERM GAIN	NET SHORT TERM GAIN
APPLE COMPUTER						
05/23/83	100	5168.88	09/10/84	2567.85	-2581.03	
GENERAL ELECTRIC						
03/14/77	100	2542.84	09/28/84	5431.00	2888.16	
ISH CORPORATION						
06/06/82	100	6072.00	09/28/84	12330.72	6258.72	

TOTAL PROFIT/LOSS FOR THIS TAX YEAR: LONG TERM = \$ 6565.85
SHORT TERM = \$ 0.00
COMBINED LONG AND SHORT TERM = \$ 6565.85

Figure 1: A report produced by Plain Vanilla Portfolio System showing year-to-date profit and loss information.

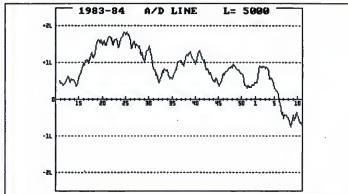


Figure 2: Sample plot of the advance/decline line produced by Technical Indicator Program.


```

!! EVALUATION FORM !! FOR CP/M !! F.O. BOX 'N' !!
!! COPYRIGHT 1983 !! WITH 48K AND !! BRADENTON BEACH, !!
!! INVESTOR'S SOFTWARE !! 80 COLUMN SCREEN !! FLORIDA, 33510 !!

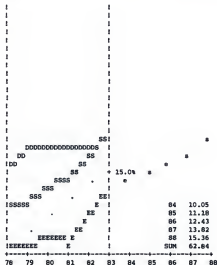
```

IBM CORPORATION
09/28/84
PAGE 2

```

THE PRESENT YIELD IS ..... 3.30%
THE AVERAGE YIELD OVER THE NEXT FIVE YEARS WILL BE ..... 5.34%
YEARLY-RETURN-LOW, (PROJECTED GROWTH OF EPS) + (AVERAGE YIELD) ..... 16.52%
YEARLY-RETURN-HIGH, (PRES. PRICE GROWS TO FORECAST HI) + (AVG. YLD) ..... 16.40%
MOST RECENT QUARTERLY EARNINGS ARE UP BY AT LEAST 10% ..... TRUE
GROWTH OF SALES IS AT LEAST AS RAPID AS GROWTH OF EPS ..... TRUE
PERCENT PRE-TAX PROFIT ON SALES -- (GROWTH TREND IS UPWARDS) ..... TRUE
PERCENT EARNED ON INVESTED CAPITAL -- (GROWTH TREND IS UPWARDS) ..... TRUE
PROFIT MARGIN -- (GROWTH TREND IS UPWARDS) ..... TRUE
GROWTH OF SALES AND EARNINGS IS STEADILY HIGHER EACH YEAR ..... FALSE
THE UP-SIDE/DOWN-SIDE RATIO IS AT LEAST 3 TO 1 ..... FALSE
TODAY'S P/E IS LOWER THAN THE AVERAGE P/E ..... FALSE
GROWTH OF EARNINGS IS ABOVE 7% ..... TRUE
PRESENT PRICE IS IN THE BUY RANGE ..... FALSE

```



'CP/M' is a registered trademark of Digital Research, Inc.

Figure 3: Page 1 of a report produced by The Evaluation Form.

your portfolio holdings and profit and loss figures to use when preparing your income taxes. *Technical Indicator Program* helps you capture historical price and volume data for individual stocks or the overall stock market and create graphic representations to which you can apply technical analysis. With *The Evaluation Form* and

Stockfocus, you can evaluate the underlying finances of a company and select stocks with fundamental analysis techniques.

Each of these six software packages costs \$100 or less. Four run on a single disk drive, and only one requires more than 64K RAM.

Portfolio Management

Although *Plain Vanilla Portfolio System* is a no-frills system, it can handle the basic stock portfolio management needs of most small investors. With it you can record up to 50 transactions for each of 50 different securities and generate a set of three basic status reports.

Plain Vanilla has no user's manual since, the authors say, all the directions are on the screen. I found the on-screen program instructions straightforward and agree that an extensive user's manual is not required. But a new computer user would welcome a manual that illustrates the basic features of *Plain Vanilla*.

To start off, you are asked to enter information about your stock purchases, such as name of company, purchase date, price, and number of shares. You enter similar information for stock sales. This information is automatically saved on a disk for later updates.

Next you manually enter the current price per share for each stock you own. Finally, you are ready to generate reports on your current holdings. Three status reports on your portfolio can be generated. A complete listing of your current holdings includes the current value and unrealized gain or loss for each stock and the total for all stocks. Individual stock reports provide a complete record of each purchase and sale transaction. Tax-year profit and loss information will show your short- and long-term capital gains and losses, particularly helpful throughout the year for tax planning and at year-end for filing returns. (See Figure 1.)

One of *Plain Vanilla's* unique features is its ability to compute potential returns for covered call option positions purchased on either a cash or a margin basis. You enter the price of the stock, the expected annual dividends, the strike price, the expiration month, option premium, and interest rate (if it's on a margin basis). The program then calculates the net cash investment, dollar return, and annualized percent yield for the covered call option position. Although this feature is interest-

MODEST INVESTMENTS

ing, it seems out of place in a program intended to be simple.

Plain Vanilla is, on the whole, simple to use. If you have a relatively small portfolio and your tax concerns are not complex, it may be what you're looking for.

If you have a larger portfolio and you want to be able to update your stock prices automatically from an information utility, such as the Dow Jones News/Retrieval, *Net Worth* is another low-cost alternative you should consider. It's not as easy to use as *Plain Vanilla*, but it does offer you the ability to track a larger number of securities, update security prices from the Dow Jones News/Retrieval, and generate more comprehensive financial reports.

Net Worth is designed for portfolios that consist of any combination of stocks, bonds, treasury notes, precious metals, and cash or cash-equivalent assets. The program also tracks liabilities, such as car loans, home mortgages, and credit cards, and so it can calculate your net worth.

The program is completely menu driven, and numerous prompts guide you through the process of entering information. A unique feature is that you can enter security prices in either fractional or decimal format.

When you enter information on purchases, you have the option to set high and low sell targets and have *Net Worth* calculate a risk/reward ratio. The risk/reward ratio is computed by subtracting the current price from the high sell target and dividing this value by the value of the current price minus the low sell target. This gives you a relative measure of the potential for the security to rise in price against its potential to fall in price. You can update high and low sell prices as often as you wish.

With *Net Worth* you can generate a wealth of reports that give you various views of your portfolio. The asset summary breaks down your portfolio's net worth into three categories: securities, precious metals, and cash or equivalent assets. The program calculates the percentage of each asset within each asset category, as well as

11 EVALUATION FORM	11	FOR CP/H	11	P.O. BOX 'N'	11
11 COPYRIGHT 1983	11	WITH 48K AND	11	BRADENTON BEACH,	11
11 INVESTOR'S SOFTWARE	11	80 COLUMN SCREEN	11	FLORIDA,	11
				33510	11

EXCHANGE: NYSE											
ISM CORPORATION											
09/28/84											
TICKER SYMBOL: ISM											
YEAR	HIGH	PRICE	LOW	EARN PER SH.	BOOK VALUE	NET PROF MARG	NET TAX	SALES REVS	DIV OR SHARE	PRE-TAX PROF ON SALES	% EARN ON INV CAP.
1983	134.30	92.30	9.04	38.02	13.7	0.0	0.0	\$40180.0	3.71	0.00	23.78
1982	98.00	55.60	7.39	33.13	12.6	0.0	0.0	\$34364.0	3.44	0.00	22.31
1981	71.50	48.40	5.63	30.66	11.4	0.0	0.0	\$29070.0	3.44	0.00	18.36
1980	72.80	50.40	6.10	28.18	13.6	0.0	0.0	\$26213.0	3.44	0.00	21.65
1979	80.50	61.10	5.16	25.64	13.2	0.0	0.0	\$22863.0	3.44	0.00	20.12
1978	N / A	N / A	5.32	23.14	14.8	0.0	0.0	\$21076.0	2.88	0.00	22.99

6 YR. AVG. WHERE APPLICABLE ==>										0.00	21.54

The area below shows the (compounded) Annual Growth Rates for the most recent five years.											
Growth of 'BOOK VALUE' has been 10.44 %											
Growth of 'EPS' has been 11.19%											
Growth of 'SALES' has been 13.77%											
Growth of 'DIVIDENDS' has been 5.20%											
'EPS' Estimates for the year 1988 will be \$15.36. It is projected at 11.19%.											

DATA PUBLISHED ON 08/31/84											
DATA FROM (V-L)											
(S&P) RATING N/A											
(V-L) TIMELINESS RATING 1											
(V-L) SAFETY RATING 1											
(V-L) 5 YR. EPS PROJ. \$ 19.50											
HIGH THIS YEAR \$134.25											
LOW THIS YEAR \$ 99.00											
PRESENT PRICE \$124.25											
YEARLY DIVIDEND \$ 4.10											
PRESENT P/E RATIO 13.00											
LATEST QUARTERLY EPS ... \$ 2.65											
YR. AGO QUARTERLY EPS .. \$ 2.22											

BUY-HOLD-SELL RANGES											
62.90 --TO-- 111.92 BUY RANGE											
111.92 --TO-- 160.95 HOLD RANGE											
160.95 --TO-- 209.97 CONSIDER SALE											
BEST BUY WOULD BE LESS THAN \$ 87.41.											

11 AVG. LOW P/E * EST. LOW EPS 83.98											
11 AVG. LOW PRICE (5 YRS.) 61.56											
11 LOWEST PRICE OF LAST 3 YRS. 48.40											
11 PRICE DIV. WILL SUPPORT ... \$7.67											
11 -----											
11 AVG. = FORECAST LOW PRICE \$ 62.90											
11 -----											
11 UPSIDE/DOWNSIDE RATIO IS .. 1.40											

Figure 4: Page 2 of a report produced by The Evaluation Form.

the ratio of each asset category to the net worth of the total portfolio.

Other reports include capital gain/loss summaries, interest earned summaries, annualized portfolio income, listings of your active buy and sell orders, and com-

prehensive information based on the latest closing prices for all owned securities or securities designated by you to be tracked.

In addition to printed reports, *Net Worth* lets you display stored security trad-

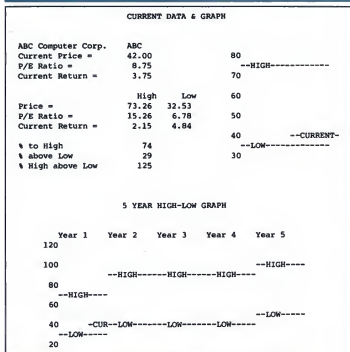


Figure 5: Stockfocus's report shows a floor and ceiling valuation for a stock.

ing information in graphic form on the screen. It can plot from 13 to 52 weeks of weekly high, low, and closing prices, and volume for any of your stocks, bonds, precious metals, or stock indexes. Although the graphs give you a quick look at the performance of a particular asset, they are not intended for technical analysis.

Net Worth is sold with a 30-day, money-back guarantee.

Technical Analysis

Technical analysis does not focus on the underlying values of companies but rather on the behavior of individual stocks and the overall market, concentrating on price movements, volume, trends, and patterns to determine which stocks to buy or sell and when or when not to do so.

Technical Indicator Program (TIP) is

an easy-to-use, inexpensive program for technical analysis. It analyzes overall market trends, giving you an easy way to track 18 technical market indicators. For each day of stock market activity, you enter the number of advancing and declining issues, advancing and declining volume, and new highs and lows. All six of these inputs are available in the *Wall Street Journal* as well as many daily newspapers.

After new data are entered and saved, you are ready to examine a few plots of the indicators to see how the market is acting. Select the indicator you want plotted from a menu of the 18 indicators, and it will appear on the screen.

Figure 2 shows a sample plot of the advance/decline line. The horizontal axis is labeled with week numbers. The vertical ticks represent Monday of the correspond-

ing week. The vertical axis is labeled in terms of a constant, *L*, and the value of *L* is in the title line. The title line also shows the name of the quantity plotted (in this case, *A/D Line*) and the year of the plotted data.

TIP's manual is clearly written, briefly describing the components of each indicator, but it does not address how these indicators should be interpreted. You may find it necessary to supplement the program with a good book on technical analysis to interpret the movement of each indicator properly.

Fundamental Analysis

Investors using fundamental analysis to find the right stocks for profitable investments base their decisions on financial facts. They examine the underlying value of companies in terms of cash, current assets, and profits, looking for situations where they can buy stocks at undervalued prices.

The Evaluation Form uses a fundamental approach developed in 1951 by the National Association of Investment Clubs, Inc. (NAIC) of Royal Oaks, Michigan. NAIC members have been doing better than the stock market averages since the time they adopted their technique.

The method *The Evaluation Form* uses is easy to understand. It manipulates about 60 elements of financial data for a company and presents results in a way that makes stock selection easy.

Data are entered in the program's Library Form, which has a fill-in-the-blanks format. The information required for the Library Form is taken from a *Standard & Poor's Sheet* or the *Value Line Investment Survey*, which are readily available at libraries and brokerage houses.

In less than 10 minutes you can enter all the required data. Then the program calculates approximately 50 values and presents you with the choice of displaying or printing the results. Results are printed on two pages, as illustrated in Figures 3 and 4.

(continued)

HANDS OFF COMPUTING.



THE FIRST \$2,000 SPEECH SYSTEM FOR ONLY \$459.

Introducing AudioPilot™ — the complete voice interface system for use with the IBM® PC, XT, and compatibles. We call it "hands-off" computing. With AudioPilot, your IBM can respond to voice commands, making all your applications faster and easier to use.

AudioPilot™ works with Lotus 1-2-3,™ VisiCalc®, Multiplan,™ pfs,™ MultiMate,™ and probably all the software you own, and interfaces with a mouse, giving you total control over your system. Other features include voice controlled auto-dialing with a Hayes® modem, voice mail capabilities, and a computer controlled voice storage and playback.

The system installs in under two minutes and saves you hundreds of hours. Best of all, this complete speech system sells for only \$459! Discover AudioPilot and "hands-off" computing. It's something to talk about.



Dealer and Distributor inquiries invited

AudioPilot, 108 Wall Wharfen Rd., Hastings, NY 11746 (516) 351-6861

AudioPilot is a registered trademark of AudioPilot Systems, Inc. IBM, Lotus, VisiCalc, Multiplan, pfs, MultiMate, and Hayes are trademarks of their respective owners. © 1985 AudioPilot Systems, Inc.

CIRCLE 105 ON READER SERVICE CARD



Contemporary ComputerWear

DUST COVERS
FOR
THE IBM PC



Attire your IBM PC in Style!

ComputerWear—Beige, 100% cotton canvas covers with grey trim and embroidered emblem. Order Now! Satisfaction guaranteed. Custom logo in quantity.

- | | |
|--|--|
| <input type="checkbox"/> Yes, protect my PC in style! Send me: | <input type="checkbox"/> Printer (Epson FX-100, . . . \$20 |
| <input type="checkbox"/> Keyboard \$16 | <input type="checkbox"/> NEC P3, Okidata \$3, 93) |
| <input type="checkbox"/> Monitor \$18 | <input type="checkbox"/> Printer (NEC 3550) \$20 |
| <input type="checkbox"/> Drive \$18 | |
| <input type="checkbox"/> 1 pc Mon/Drive \$36 | <input type="checkbox"/> Visa <input type="checkbox"/> MC <input type="checkbox"/> Check |
| <input type="checkbox"/> Printer (Epson MX/FX-80, . . . \$18 | |
| Okidata 82, 92) | Add \$2.00 Shipping. Total: |
| | (California residents add tax) |

Print Name _____
Address _____
City/State _____ Zip _____
Credit Card # _____ Exp. _____

Contemporary ComputerWear At: EM

1320-36th Ave., / San Francisco, CA 94122 / (415) 759-1466

IBM is a registered trademark of IBM Corp. Dealer inquiries invited. PC-AI covers available.

CIRCLE 121 ON READER SERVICE CARD

MODEST INVESTMENTS

The hard job is to interpret the results of *The Evaluation Form* correctly. The user's manual is very helpful, devoting two chapters to such interpretation and the application of good judgment regarding which stocks to buy.

The Evaluation Form is an excellent aid that significantly reduces the time it takes to implement the NAIC's time-proven approach to fundamental analysis.

Another program for determining the underlying value of a stock is *Stockfocus*, which uses information about the financial status and performance of the company being analyzed. Specifically, *Stockfocus* requires you to enter total capitalization, total shares outstanding, total debt, trading volatility (optional), total interest on debt, and up to 5 years of earnings per share and dividend payout ratio. This information is available from a number of sources, including *Annual Reports* and the *Value Line Investment Survey*.

Using this information, the program computes a floor and ceiling valuation for the stock, which is displayed numerically and graphically, showing the current price in relation to the range. Figure 5 shows a sample report.

Stockfocus is not particularly easy to use, nor is the documentation of the quality to which you've probably become accustomed, but given the small selection of low-cost fundamental analysis packages currently available, it is one of the better programs.

Smart investors realize that with the stock market changing by the minute, they need all the help they can get to keep up. So take a close look at these low-cost investment software alternatives. You may find they give you everything you need. At the very least, you'll find that they're excellent supplements to your library of investment programs. ■

Thomas A. Meyers is founder and president of the American Association of Microcomputer Investors, a nonprofit organization that provides information on applications.

INTRODUCING AST GRAPHPAK.TM

THE POWER TO BUILD ON FRAMEWORKTM AND ORCHESTRATE SYMPHONY.TM



AST delivers the powerful integrated hardware you need to unlock the full capabilities of your integrated software. Including FrameworkSymphony, Lotus 1-2-3[®] Multiplan[®] and more.

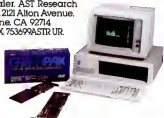
GraphPak is a complete, convenient solution—two plug-in boards for the IBM[®] PC, XT and their compatibles. And it's packed with advanced features. Expanding memory to 640KB, GraphPak gives you the space to operate state-of-the-art programs, handle more data, and create larger spreadsheets. And it lets you take full advantage of the sophisticated graphics capabilities of your software, bringing high-resolution, bit-mapped displays to your monochrome screen.

IBM-compatible serial and parallel ports mean you can easily add a letter-quality printer and a modem to connect with services such as Dow Jones[®] EasyLink[®] and CompuServe[®]. Further, our built-in clock/calendar provides automatic date stamping.

Productivity-boosting SuperPak[™] utilities give you SuperDrive which responds fifty times faster than a disk drive and SuperSpool which lets you input and print at the same time.

All this is yours in an easy-to-buy, easy-to-install, easy-to-use package that costs less than individual components.

Find out about AST's total solutions. See your dealer for facts on GraphPak and our complete family of multifunction boards and communications LAN, graphics and modem products. Or call our Customer Information Center (714) 863-1333 Ext. 5249 for your nearest dealer. AST Research, Inc. 2121 Allon Avenue, Irvine, CA 92714. TWX 753699ASTR UR.



AST

RESEARCH INC.

IBM PC and XT trademarks of International Business Machines Corporation. Symphony, Lotus and 1-2-3 trademarks of Lotus Development Corporation. Framework trademarks of Ashton-Tate Multiplan trademarks of Microsoft. Dow Jones trademarks of Dow Jones & Co. Inc. EasyLink copyright Western Union. CompuServe is an IBM Block Company. GraphPak and SuperPak trademarks of AST Research Inc.

CIRCLE 101 ON READER SERVICE CARD

PC-870: Fast Anchor for Your Network

Networks voraciously devour massive chunks of disk storage. Ordinary hard disks that give speedy performance in a single-user XT fill up and bog down under the strain of networking; servicing the needs of half a dozen people demands greater capacity and faster performance. The hard disk that anchors a good-size network must be heavyweight indeed.

More than just its name indicates that the U.S. Design PC-870 Network Storage System is aimed particularly at filling the high-performance demands of networking. In weight alone, its 8-inch hard disk and tape backup have what it takes to anchor a network. At 43 pounds, these two make up one of the heaviest accessories you can add to your system.

The PC-870 also performs at top speed. Its manufacturer rates it as the fastest disk you can attach to your PC. This claim is half right. It's the fastest-reading drive but not the fastest-writing one.

Moreover, this system is a brute. Like

A novel memory cache makes this heavyweight hard disk a sturdy—and fast—network anchor. Its drawbacks are its loud noise and cumbersome size.

a battleship, it's built to take it. This ship can fire the admiral's communications broadsides across the network channels as easily as it can wend through the narrowest DOS commands. And if its bullet-proof construction isn't enough to assure the safety of your database, its built-in, 1/4-inch tape cartridge backup certainly is.

Despite its two massive internal circuit boards packed with chips, the PC-870 is simple to use and as easy to access as a PC's own disk drive, once installed under DOS 2.0 or later. Its capacity should be sufficient for all but the most sprawling networks. It has 57,344,000 bytes of available storage on its single 8-inch Win-

chester hard disk drive. (The manufacturer's rating of 70 megabytes refers to unfur-matted capacity.) The PC-870's four-track tape will put about 20 megabytes onto a tape cartridge (the exact capacity depends on the length of your tape).

Of course, anchors are likely to have their barnacles and rough spots, and the PC-870 is no exception. It's as brash and loud as a sailor on shore leave and has proved somewhat argumentative during installation as well.

A New Player

U.S. Design Corporation, a name familiar in the minicomputer arena, has

**PC-870 Network Storage System**

U.S. Design Corporation
5100 Philadelphia Way
Lanham, MD 20706

(301) 577-2880

(800) 368-2811

List Price: \$7,895

Requires: DOS 2.0 or later.

CIRCLE 646 ON READER SERVICE CARD

offered accessories for Digital Equipment Corporation minicomputers. The PC-870 is the company's first package aimed particularly at the IBM personal computer market.

The PC-870 shows its heritage admirably, and its packaging is first-rate. At its heart is an 8-inch Priam hard disk drive with a voice-coil head positioner—hardware more likely found on minis than on today's micros. Along with the Priam's extra 2 3/4 inches of disk (over the 5 1/4-inch

drives normally attached to a PC), is an added measure of sturdiness and speed.

In fact, the size difference of the Winchester amounts almost to a philosophical difference. An 8-inch drive generally is built for ruggedness and dependability and it must match the standard set by the expensive minicomputers it's built for. In general, the 5-inch drives struggle in a much larger marketplace, where production volume's a key to lower prices. These drives make up for their smaller storage

**Your computer
is smart ...
Your
workstation
should be, too!**



CompuCart is "The Smart Cart." Smart because it gives you comfort, convenience, mobility and security, all in one compact PC workstation. CompuCart is ergonomically engineered to adjust for the user's comfort. It's designed to enclose and secure both hardware and software with one key. And, CompuCart's twin-wheel casters let you move the compact CompuCart with ease! Now that's a Smart Cart!

- Holds a complete PC system • Adjusts for hardware and user
- Controls cabling and hardware • Rolls easily • Locks securely with one key • Quiets the printer • Very affordable • High quality materials and craftsmanship • Cools computer hardware
- Human-factor engineered (ergonomic design) • GSA scheduled

Products of Versa Tec Corporation • 60 years of craftsmanship

"The Smart Cart!"
COMPU-CART



CIRCLE 199 ON READER SERVICE CARD

CALL TOLL FREE 1-800-237-9024

IN FLORIDA CALL (813) 251-2431 • PO Box 9095, Tampa, FL 33601-2095

area with precision mechanisms to compete with the bigger drives for capacity. The 5¼-inch Winchester are also sturdy; it's just that the 8-inchers are sturdier.

By itself, the Priam drive is a speed demon. But U.S. Design squeezed even more from the PC-870 system by adding an elaborate disk-caching scheme. Whenever you access the PC-870's disk, it doesn't just read what you or your program ask for, but speeds through a whole cylinder (or track) looking for (and remembering) even more, like most cache memories. It holds that extra information in memory, and if you later want to read the sector following the first one you saw, the cache shoots out the data at RAM speed without waiting for the disk. Rotational latency, the long wait while the disk goes around, disappears entirely.

In fact, the U.S. Design caching scheme is more elaborate than track buffering. The PC-870 has a 64K cache memory and a microprocessor that runs a sophisticated program that learns from what you request and determines what data you're most likely to want next. It keeps the most-in-demand information in RAM, constantly updating the buffer to reflect what it thinks you want. The performance advantage can be substantial.

Writing to disk apparently does not involve the cache, but the information is stored quicker at the Priam's normal speed.

The Once Over

A big disk needs a big box to encase it. The PC-870 is 17 inches wide, 22.5 inches deep, and 5¼ inches high. U.S. Design calls this a desktop design, but the PC-870 overwhelms the average desk.

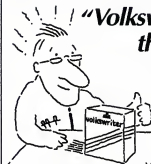
The machinery generates a racket mostly because of the industrial-strength cooling fan and partly because of the turbine howl of the hefty disk drive and the mechanical clatter of the tape transport while it's operating.

Fortunately, U.S. Design supplies a generous ribbon cable (about 8 feet long) to attach the monster to your system. And

you can keep the transport in an adjacent closet to muffle the roar. Better yet, you can tie the PC-870 to your network and place it outside the office where it can be

locked. This safeguard will doubly secure your data.

The case's top cover, made from sheet metal much sturdier than that of a PC,



"Volkswriter® Deluxe..." the critics' choice!

“Thirty word processing programs were reviewed ... no other program received a higher overall evaluation than Volkswriter Deluxe.”
Software Digest Ratings Newsletter,
January 1984

“If WordStar™ set a standard ...

Volkswriter Deluxe sets a new standard for transparency, simplicity, and speed. You can learn Volkswriter in under an hour ... because it does so many things exactly the way you think they should be done.”

“VOLKSWRITER DELUXE is the best buy in the IBM-PC™ writing tool arena.”

Charles Spezzano, *Whole Earth Software Review*, January 15, 1984

“Volkswriter Deluxe ... a simple way to word processing power ... for writers who like to think.”

Washington DC Capital PC User's Group Vol. 3, #4

“Lifetree ... provides exceptionally helpful and competent assistance to registered owners, and the company's update policies are excellent.”

“In sum, this is a unique word-processing program.”

John Lombardi, *Reviewer*,
InfoWorld, April 16, 1984

We couldn't have said it better ourselves!

Suggested Retail Price: Volkswriter
Deluxe \$295 for the IBM-PC,
PC compatibles, TI Professional™
and TRS-80 Model 2000.*

“Simply amazing”

*IBM PC is a trademark of International Business
Machines. TI Professional Computer is a trademark of
Texas Instruments. TRS-80 Model 2000 is a trademark of
Tandy Corp. WordStar is a trademark of MicroPro.

© 1984 Lifetree Software, Inc.



**LIFETREE
SOFTWARE INC.**

411 Pacific Street
Menlo Park, California 94040
(408) 373-4718 / TWX 176-786

slides forward and off after you remove a single screw on each side. Internally, the PC-870 is divided in half. On the right is the Priam drive, buried under a large circuit board; on the left there's a four-track, 1/4-inch tape transport made by Data Electronics, Inc. Behind the tape is a hefty switching power supply which has the tape controller circuitry atop it.

The electronics inside the PC-870 chassis handle all the disk and tape control functions. The small expansion card you need for connecting the PC-870 system with your host PC functions only as a bus adapter that routes your computer's internal signals to the big auxiliary box.

The front panel of the PC-870 has several indicators and switches. A central red light serves as a power-on indicator. On the left are three lights indicating that the tape is rewound and ready to accept data or is rewinding (labeled "Load Point"), whether the tape is accepting data (labeled "Tape Busy"), and whether the write-protect tab for the tape has been set (labeled "File Protect"). A big, square button lets you instruct the tape to rewind immediately. The tape also automatically rewinds three times—when you turn the power on, when you make a back-up command, and when it completes the back-up process.

The fancy gadgets are on the left, directly below the cartridge slot. Two 8-element LED bar indicators monitor tape and disk activity. In a binary code they flash to indicate what sector is being used. When the tape or disk is not in use, each indicator shows an "idling" pattern. Next to each indicator is a tiny diagnostic test switch.

Installation Irritation

Despite its near mechanical perfection, U.S. Design's PC-870 isn't trouble free. Installing the company's latest controller/interface system to link the PC-870 with a PC showed its state-of-the-art, boot-from-hard-disk feature to be full of bugs. In fact, I couldn't get all its features to operate well with either a standard PC or a PC-compat-

ible. An older controller card, which also accompanied the review unit, made the PC-870 bug-free through the use of standard DOS device drivers to link the software of the two systems.

The boot-from-hard-disk feature smacks of newness in other ways. It's not mentioned in the PC-870's thin but adequate (and clearly written), spiral-bound manual. Sole reference and instructions come in a READ.ME file on the software disk accompanying the unit. Its two pages of latest instructions give the rudiments of getting the new interface card to work.

Ideally, U.S. Design's latest interface requires only that you use the standard PC-DOS FDISK and FORMAT utilities to partition the two logical drives of the PC-870 and format them (putting the operating system on one of them so that DOS can boot from it).

My first attempts at this procedure were with a PC-compatible and MS-DOS. I formatted the first of the two logical drives properly and even booted the system using it. The second drive, however, either stopped before finishing formatting or filled its directory with uneraseable garbage. Moreover, sometimes the normal turn-on would work well and boot up the PC-compatible after one quick stroke. Other times it would wreak havoc.

Finally, when I turned the system on and it emitted a menacing electronic growl, I gave up on the compatible. I thought I'd give the PC-870 the benefit of the doubt (perhaps the BIOS of the PC-compatible machine was not that compatible). So I lugged the PC-870 into my office to connect with an IBM PC.

With PC-DOS 2.1, my results were again unsuccessful. This time I was able to format both disks properly (or to a semblance of that), but the boot-from-hard-disk feature caused me nothing but heartache. Once, it booted from the D: drive (and I couldn't find the C: drive anywhere). Once, it booted from the C: drive. Thereafter, my system completed its power-on self-test, spun the unready A: drive, and proceeded directly to BASIC. To get

things going again, I booted from the A: drive and went through the installation process again. I booted again, forgetting to disengage the A: drive. Surprise, I was back to BASIC again.

Investigating the cause, I discovered that something ate my boot disk in the A: drive. Was it the PC-870? I don't know. But my patience was wearing thin, and so I tried the alternative, manual-documented installation procedure.

I pulled the new interface card from my PC and put the nonbooting one in its place, installed the U.S. Design device drivers, and had no problems. Just to be safe, I repartitioned and reformatted the hard disk using the proprietary U.S. Design programs and began using the system.

The procedure used by the PC-870 is the same as for any standard installable device driver. It simply requires a DEVICE = UFDISK.SYS line in the system's CONFIG.SYS file and a boot-up. For DOS neophytes, U.S. Design also thoughtfully includes a prefabricated CONFIG.SYS file that you need only copy to your boot disk.

With the DOS FORMAT program and the boot-from-disk controller, formatting one 28-megabyte disk took about 3 minutes—when it worked. With the U.S. Design proprietary program and the older controller, formatting took a few seconds. Compared with other drives, even a time of 3 minutes would be remarkably fast to format 30 megabytes.

Because of the limitations of PC-DOS, the entire capacity of the PC-870 cannot be used as a single disk. In its standard configuration, DOS can remember only where to put 33 megabytes of data. Hence, like all larger hard disks, the PC-870's actual or "physical" disk appears as several smaller "logical" disks (or partitions) to the operating system.

The PC-870 is not so flexible in partitioning as most larger hard disk systems. The full 57-megabyte disk is cut into two logical disks of 28,672,000 bytes each. Each part of that twosome can then be partitioned into smaller volumes.

Time Trials

In everyday operation, the PC-870 worked hard. When I called to it for data, it blazed back to the PC visibly faster than with most hard disks connected to an ordinary PC. I copied normal-length (5-64K) files to a RAMdisk about as quickly as DOS could display their names on the screen.

The standard PC Magazine test of disk speed confirmed my observations. Reading twenty 1,024-byte files ten times took 8 seconds, the exact time needed to read the information from a RAMdisk emulator. Clearly, U.S. Design's cache memory was working well. But disk writes were not so quick because they do not benefit from the disk cache. In the standard PC Magazine test for writing to disk, the PC-870 turned in an ordinary 23-second time on a virtually empty disk. On a nearly full disk, the write time rose to 25 seconds.

Clearly, the PC-870 lives up to its high-speed claims when reading. Thus, it is a good choice to anchor your network, particularly if your system shares programs and a database with many machines.

Like nearly every back-up system, the PC-870's 1/4-inch cartridge tape has both good and bad points. On the plus side, it lets you use the media optimally by squeezing a lot of data onto one tape from several back-up sessions. Many systems allow only one back-up session per tape, whether you're backing up one file or a thousand. This restriction can waste many cartridges, particularly if you need to back up files from several directories. And this means that every time you switch directories, you must switch tapes also.

The PC-870 has no such problem. Rather, it has a special back-up option that allows you to append more files onto a previously used tape. If you want, you can "zero out" (erase) the tape's directory using a single command to recycle its entire capacity.

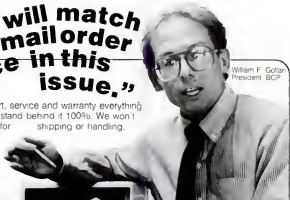
The PC-870 back-up utility has most of the same options as the standard DOS version: /S, to search subdirectories; /M, to back up only files modified since the last

backup; /D, to back up only files written on or after a specified date. A special /Q option lists files before they are in back-up and waits for you to choose whether to

back them up. Unlike the DOS utility, the program supplied by U.S. Design allows only backing up to the PC-870's cartridge tape, although it lets you back up any disk

"We will match any mail order price in this issue."

We'll support, service and warranty everything we sell and stand behind it 100%. We won't charge you for shipping or handling, nor will we penalize you for using a credit card



William F. Gofan
President BCP

MONITORS		SOFTWARE	
Apple IIe	154.95	Word Processing	12.95
Phosphor III RGB	489.95	Microsoft Word	229.95
Phosphor III RGB	489.95	Multimate	264.95
Phosphor III RGB	489.95	PIPS Pro	64.95
Phosphor III RGB	489.95	PIPS Report	84.95
Phosphor III RGB	489.95	PIPS 300	64.95
Phosphor III RGB	489.95	Samira II	299.95
Phosphor III RGB	489.95	Three Task	109.95
Phosphor III RGB	489.95	Wordperfect	249.95
Phosphor III RGB	489.95	Wordstar 2000	249.95
Phosphor III RGB	489.95	Wordstar 3000	309.95
Phosphor III RGB	489.95	Business & Personal	279.95
Phosphor III RGB	489.95	Lotus 1-2-3	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95
Phosphor III RGB	489.95	Microsoft Query	279.95
Phosphor III RGB	489.95	Microsoft Excel	279.95
Phosphor III RGB	489.95	Microsoft Project	279.95
Phosphor III RGB	489.95	Microsoft Access	279.95
Phosphor III RGB	489.95	Microsoft Base	279.95

PC-870

drive in your system, not just those in the PC-870.

The PC-870's restore utility allows single files, groups of files, or an entire tape to be restored to any disk. Files always are restored to the same directory name from which they came. If the proper directory does not exist when the file is restored, the program creates it.

The PC-870 cartridge tape does not function as a true tape streamer. It works more as start-stop tape, recording a block of data, pausing, and then recording the next. Even in large files (as large as 8 megabytes for example), it starts and stops every few seconds. Moreover, it's a unidirectional mechanism; the U.S. Design cartridge must rewind after it reaches the end of a tape and return to the beginning to start the next track.

The pauses and rewinds between

blocks make for slow backups. Backing up a nearly full disk (28,614,656 bytes) of eight exceptionally long files (lengths ranging from 100K to 8 megabytes), which should have favored faster backups, took me 44 minutes and 5 seconds. Of that, perhaps a minute or so was spent changing tapes. Although the rated capacity of a tape is 20 megabytes, it took me three to back up one 28-megabyte hard disk.

The PC linked to the PC-870 is tied up during the entire back-up process, despite the fact that both the disk and the tape transports of the PC-870 have their own separate, internal controllers, each with its own microprocessor in command.

Although substantiating the PC-870's claim that it's the fastest disk drive system you can add to your PC may not be possible, I doubt whether you can find a faster drive. Its cache memory feature takes it to

the ultimate speed limit for ordinary PCs. Undoubtedly, certain disk requests may befuddle the algorithm that controls the cache, but the speed limit imposed by the Priam drive itself is a high one.

Currently, the boot-from-hard-disk feature of the PC-870 needs work. If you demand that feature in a hard disk subsystem, you had best wait for the next version of the PC-870's software. Moreover, the PC-870's packaging, although sturdy, makes finding a home for it difficult. In addition, you may find that the machine is too noisy for you to share space with in your office.

In a network, though, these problems may be immaterial. You can put the PC-870 somewhere out of sight and out of earshot. Then you and everyone in the network will be able to share its speedy performance and large capacity. ■

4,500 Programmers depend on us to find, compare, evaluate products and for solid value.

ARTIFICIAL INTELLIGENCE

EXSYS - Expert System building tool. Full RAM, Probability, Why, Intriguing, serious. PC DOS \$200

PROLOG-86 - Learn fast, Standard, tutorials, samples of Natural Language, Exp. Sys. MSDOS \$125

C PROGRAMMING

INSTANT C - Interactive development - Edit, Source Debug, run. Edit to Run - 3 Secs. MSDOS \$500

"INTRODUCING C" - Interactive C. 500 page tutorial. PC DOS \$95

Ask for MS, Lattice, C86, Williams.

BASIC PROGRAMMING

"BASIC COMPILER": Better BASIC all RAM, modules, structure. \$185

BASIC DEVELOPMENT SYSTEM - (BDS) for BASIC; Adds Renum, crossref, compress... \$115.

Screens: Screen Sculptor (\$119) or Databurst (\$215).

SUPPORT PRODUCTS

BRIEF Programmer's Editor - undo, windows, reconfigurable, macro programs, powerful PC DOS \$195

PLINK-86 is a program-independent overlay Linker to 32 levels for all MS Languages, C86 and Lattice. \$315

ADVICE: Call when you need help choosing products for "AI, BASIC, C, COBOL, Debuggers, Editors, FORTH, FORTRAN, Libraries, PASCAL..."

CALL TOLL FREE 800-421-8006

THE PROGRAMMER'S SHOP™

The programmer's complete source for software, services and answers

128-S Rockland Street, Hanover, MA 02339 In Mass... 800-442-8070 or 617-826-7531

CIRCLE 391 ON READER SERVICE CARD

A Comprehensive Professional Level

Net Worth

Portfolio Management System

A Steal!

JUST \$59.95

(Reg. \$295.00 Value!)

New enhanced Version 1.1C

net worth™ 1.1C — all that you'd expect at a price that leaves money left over to invest. Handle single or multiple portfolios. Access Data, Issues or manually enter data. Manage stocks, bonds, 1-bills, mutual funds, precious metals, even cash or equivalents. Follow owned as well as designated securities. Update with latest, daily or weekly prices. Generate 12 reports for thorough record keeping. Great for IRAs, Keoghs or Trust Accounts. Best of all there's a 30 day money back guarantee and it's tax deductible too! Requires IBM PC AT or MS DOS compatible, screen display, printer and DOS 1.1, 2.0 or 2.1.

Order your copy of Net Worth™ today
CALL TOLL FREE
1-800-433-3605 TX 817-473-9249
MS or Visa Accepted

BULLISH™
INVESTMENT SOFTWARE

P.O. Box 853 • Mansfield TX 76063
Please add \$5 for shipping & handling

CIRCLE 114 ON READER SERVICE CARD

Copying Files Selectively

Here's a file backup program and an explanation of how it works that will turn a programmer's tedium into a Te Deum.

Backing up selected files onto another floppy disk (or repeatedly loading up a RAM drive) is usually a laborious chore because you have to type out each desired filename from the DIR listing. As a result, I don't back up my files as often as I should. And, of course, I end up regretting it.

To eliminate the tedium of keying in all those filenames, I wrote a short utility program called Move. Designed to work with double-sided disks, Move zips through an entire disk (or all the types of files on it you designate) and asks you, file by file, whether this one should be transferred to your designated destination. It's used like COPY, except that the PC supplies the filenames for you. All you do is hit Y (either upper- or lowercase) for yes, or any other character for no.

For example, if you type MOVE *.* B:, the program runs through all the files on your currently logged disk and copies the files you pick to the B: drive. To make backups of selected BASIC files, you might type MOVE *.BAS *.OLD. If you want your .EXE commands to run at maximum speed, you would enter MOVE *.EXE D:, where D: is the drive letter for your RAMdisk.

To get Move up and running on your PC, all you have to do is type in a BASIC program and run it. This produces the file MOVE.COM, which is only 430 bytes

1985/No. 6



long. To show you how the Move utility does what it does, however, I must explain some details of the inner workings of the PC's operating system. I hope to show you how DOS handles files at the lowest level.

How Move Moves

Whenever you run a program and type in the names of two files after it on the command line (such as, "MOVE PAWN ROOK.SIX"), DOS tells the program what file names were entered by making File Control Blocks for each of them. A File Control Block (FCB) is to DOS what the file's name is to us. Indeed, it is more: the File Control Block contains everything

SOMEBODY

Has To Have The Lowest Prices

IBM PC, 256 K, One Half Height 320 K Disk Drive DS/00, Perisat Color Card, Texan Green Monitor, DOS 2.1, PLUS a 10MB Hard Disk Sub System all for

\$2690.00

IBM PC, 256 K, Two Half Height Drives DS/00, Perisat Color Card, Texan Green Monitor, DOS 2.1, 130 Watt Power Supply PLUS a 10MB Hard Disk Sub System all for

\$2990.00

IBM PC, 256 K, Two Half Height Drives DS/00, Perisat Color Card, Texan Green Monitor, DOS 2.1, 130 Watt Power Supply, 10MB Hard Disk Sub System, PLUS 10MB Tape Back Up System all for

\$3579.00

IBM PC, 256 K, Two Half Height Drives DS/00, Perisat Color Card, Texan Green Monitor, DOS 2.1, 130 Watt Power Supply, 20MB Hard Disk Sub System all for

\$3380.00

IBM PC, 256 K, Two Half Height Drives DS/00, Perisat Color Card, Texan Green Monitor, DOS 2.1, 130 Watt Power Supply, 20MB Hard Disk Sub System PLUS 10MB Tape Back Up System all for

\$3779.00

(We configure and test the system at no extra cost.)

MONITORS

AMBER 300	\$120.00
PGS HX-12	\$475.00
PGS MAX-12	\$180.00
PGS SR-12	\$485.00
TAXAN GREEN COMPOSITE	\$125.00
TAXAN AMBER COMPOSITE	\$135.00
TAXAN GREEN W/TTL PLUS	\$290.00
TAXAN AMBER W/TTL PLUS	\$150.00
IBM MONOCHROME DISPLAY	\$260.00
IBM COLOR DISPLAY	\$560.00

PRINTERS

EPSON Fx 80	\$425.00
-------------	----------

(Accessories on NEC & OKIDATA printers available)

DRIVES

TANDON TM-100-2	\$179.00
SLIMLINE - TOSHIBA	\$155.00
SLIMLINE - TEAC 508	\$155.00

MULTIFUNCTION CARDS

AST LCH 1 SER & 1 PAR	\$179.00
AST SX PACH 54K 1 SER & 1 PAR	\$269.00
QUADBOARD 84K	\$260.00
IBM COLOR GRAPHIC ADAPTER	\$225.00
IBM MONO PRINTER ADAPTER	\$230.00
PERYST COLOR ADAPTER	\$160.00
PERYST MONO PRINTER ADAPTER	\$170.00
HERCULES GRAPHIC CARD	\$240.00
HERCULES COLOR CARD	\$270.00
STB GRAPHICS PLUS II	\$375.00

MODEMS

HAYES SMART MODEM 1200	\$440.00
HAYES SMART MODEM 300	\$270.00
HAYES 1200B PLUS IN CARD	\$420.00
OU81C PC 232A/1200 EXT	\$275.00
OU81C PC 232C/1200 INT	\$290.00

HARD DISKS

10MB SUB SYSTEM INT	\$950.00
10MB SUB SYSTEM EXT	\$1025.00
10MB TAPE BACK UP	\$590.00

GENERAL

CONTROL DATA DISKETTES	\$25.00/box
KEYTRONIC KB5151	\$109.00
PARALLEL CABLES	\$25.00
84K RAM UPGRADE KIT	\$50.00
128K RAM UPGRADE KIT (for AT)	\$190.00
IBM PC POWER SUPPLY (Original) 8 & 9 Watts	\$49.00
IBM KEYBOARD FOR PC (Original)	\$106.00

Microshop
COMPUTER PRODUCTS

(714) 838-7530

2640 Walnut Avenue, Unit K,
Tustin, California 92680

(Prices & availability subject to change without notice
— IBM is a registered trademark of IBM Corporation)

GAME BOOKS FROM CREATIVE COMPUTING



BASIC COMPUTER GAMES, Microcomputer Edition, edited by David H. Ahl. Here's a great collection of 101 fascinating games, all written in easy-to-use Microsoft BASIC. Play Craps, Combat, Super Star Trek, Lunar LEM Rocket, Gomoku, Checkers, Bowling—and 93 others! With an introduction, notes on Microsoft BASIC, and conversion instructions for other BASICs, 8 1/2" x 11", softcover, illustrated, with an index. 183 pp. \$7.95 (\$15.00) #6C

MORE BASIC COMPUTER GAMES, edited by David H. Ahl and Steve North. In this sequel to *Basic Computer Games* you'll find 84 challenging new games, complete with sample runs, program listings and illustrations. All run in Microsoft BASIC. Race your Ferrari, become a millionaire, joust with a knight, crack a safe, and more! Conversion table to other BASICs included. 8 1/2" x 11", softcover, illustrated, 200 pp. \$7.95 (\$15.00) #6C2
TRS-80 Microcomputer Edition, \$7.95 (\$15.00) #6C4

TRS-80 is a registered trademark of the Radio Shack Division of Tandy Corp.

CREATIVE COMPUTING PRESS Dept. PFC

30 East Hancock Avenue, Monticello, New York 07030

Send me the books listed below.

ITEM NO.	QTY	TITLE	PRICE EACH	PAY ()	TOTAL

CA, NY and NY residents add applicable sales tax.

Outside USA add \$3 for regular postage and handling and air mail.

CHECK ONE

☐ PAYMENT ENCLOSED

☐ CHARGE MY

☐ American Express ☐ MasterCard ☐ Visa

(Charge and please order \$40 minimum.)

Card No. _____ Exp. Date _____

Mr. Mrs. Ms. _____ (please print full name)

Address _____ Apt. _____

City _____

State _____ Zip _____

For faster service, CALL TOLL FREE: 800-431-8112

(In NJ call 201-540-0465)

Also available at your local bookstore or computer store.

NAME _____ ADDRESS _____ CITY _____ STATE _____ ZIP _____

PROGRAMMING

DOS needs to know about a file.

When DOS loads a program, it sets up a header (a "Program Segment Prefix") for it. In the header, at location 5C, it puts the File Control Block for the first file it is to use—the file named PAWN in the example above. The FCB for a second file (ROOK.SIX) goes into location 6C. The program itself begins at 100H.

As originally supplied by DOS, the File Control Blocks are unopened, just as the files are unopened. An unopened FCB contains 12 bytes; the first byte contains the drive number the file is on, the next 8 bytes are the file's name (filled out with spaces, like this: "ROOK "), and the last 3 are the file's extension (SIX). A full, opened FCB has 37 power-packed bytes in it. Some of these bytes will be important to you (and others not so important) depending on just how you want to read from or write to your file. Like BASIC, assembly language gives you the option of working with your files in two different ways.

Sequential and Random Access

Sequential reading of files is like reading a page in this magazine. You start at the top and stroll, word by word, to the bottom. A sequential file is like a chef's dinner, which begins with appetizer, salad, soup, and moves on automatically all the way down to pastry and brandy. You don't have to worry about which course comes next because what you want will be

the next one in line. When reading files sequentially, DOS, like the chef, keeps track of your place for you.

Random reading and writing might be compared to an eager diner who wants to skip directly to the main course. Here, the guest knows just which one of the series he wants and is going to pick it out instead of working through all the others sequentially. If you give DOS the place number of the main course in the file, DOS will get it for you. When you're using a file randomly, you, not DOS, must keep track of where you are in it.

Sequential reading and writing is used when you're simply reading a file in and then writing it back out again in the same order. Random access is used if you have a particular entry in mind and you don't want to go through all the other entries to get to it.

Just as a dinner (normally) consists of a number of courses, so a file consists of a number of records. The appetizer might be record 0, the salad, record 1, and so on. In assembly language, you are responsible for setting up the record size yourself if you don't like the size DOS gives you (128 bytes). You'll see shortly that MOVE.COM does this.

The Opened FCB

Using random files in assembly language is pretty much the same as it is in BASIC. First, you open the file using DOS function call 15, which involves

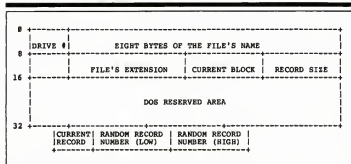


Figure 1: A fully opened File Control Block.

PROGRAMMING

loading the AH register with 15 and executing an INT 21H instruction. In BASIC, you might say OPEN "FILE" AS #1 LEN=1024, which means you want to use buffer 1 and give it a length of 1,024 bytes. With DOS, you also choose a buffer, which is called the Disk Transfer Area, or

DTA. The default DTA provided by DOS is 128 bytes long, as is BASIC's default buffer size. You set the length of your DTA buffer by putting the length you want into the "record size" word of the file's File Control Block, as indicated in Figure 1. Thereafter, every time you read or

write, this number of bytes will be read or written.

You may fill your buffer with whatever data you want. (In BASIC, you do this with either LSET or RSET statements.) If your data is to be written as record number 12 in your file, for example, you set the

```

10 OPEN "MOVE.COM" AS # 1 LEN = 1 'Open Move.com
20 PRINT "CREATING MOVE.COM"
30 FIELD #1,1 AS BYTE.$ 'Specify what goes into it
40 FOR N = 1 TO 384
50 READ BYTE.$
60 IF BYTE.$=-1 THEN GOSUB 110 ELSE LSET BYTE.$=CHR$(BYTE.$):PUT #1
70 NEXT N
80 CLOSE #1 'Close file
90 PRINT "MOVE.COM CREATED." 'And you're done.
100 END
110 FOR I=1 TO 47:LSET BYTE.$=CHR$(0):PUT #1:NEXT I:RETURN
120 DATA 235, 95, 144, 40, 67, 41, 32, 83, 46, 32
130 DATA 72, 79, 76, 90, 78, 69, 82, 32, 49, 57
140 DATA 56, 52, -1, 13, 10, 67, 111, 112, 121, 32
150 DATA 36, 32, 40, 89, 47, 78, 41, 63, 36, 13
160 DATA 10, 68, 105, 115, 107, 32, 70, 117, 108, 108
170 DATA 36, 185, 32, 0, 190, 108, 0, 141, 62, 22
180 DATA 1, 243, 164, 186, 92, 0, 180, 17, 205, 33
190 DATA 60, 255, 117, 3, 233, 50, 1, 180, 9, 141
200 DATA 22, 69, 1, 205, 33, 185, 11, 0, 187, 129
210 DATA 0, 180, 2, 138, 23, 67, 205, 33, 226, 249
220 DATA 180, 9, 141, 22, 77, 1, 205, 33, 180, 1
230 DATA 205, 33, 60, 89, 116, 7, 60, 121, 116, 3
240 DATA 233, 239, 0, 185, 37, 0, 141, 54, 22, 1
250 DATA 191, 192, 0, 128, 124, 1, 32, 117, 16, 87
260 DATA 81, 141, 62, 22, 1, 71, 185, 11, 0, 176
270 DATA 63, 243, 170, 89, 95, 187, 0, 0, 128, 60
280 DATA 63, 117, 9, 187, 128, 0, 129, 235, 22, 1
290 DATA 3, 243, 164, 43, 243, 226, 234, 186, 128, 0
300 DATA 180, 15, 205, 33, 186, 192, 0, 180, 22, 205
310 DATA 33, 129, 38, 59, 1, 0, 0, 187, 142, 0
320 DATA 199, 7, 0, 128, 187, 144, 0, 139, 7, 163
330 DATA 61, 1, 131, 195, 2, 139, 23, 137, 22, 63
340 DATA 1, 185, 0, 4, 247, 241, 163, 65, 1, 247
350 DATA 194, 255, 255, 116, 4, 255, 6, 65, 1, 187
360 DATA 206, 0, 199, 7, 0, 4, 141, 22, 174, 2
370 DATA 180, 26, 205, 33, 186, 128, 0, 180, 20, 205
380 DATA 33, 60, 0, 126, 6, 129, 14, 59, 1, 1
390 DATA 0, 185, 32, 0, 141, 22, 174, 2, 137, 22
400 DATA 67, 1, 186, 192, 0, 180, 21, 205, 33, 60
410 DATA 0, 116, 11, 141, 22, 85, 1, 180, 9, 205
420 DATA 33, 235, 80, 144, 255, 14, 65, 1, 116, 24
430 DATA 129, 6, 67, 1, 0, 4, 139, 22, 67, 1
440 DATA 180, 26, 205, 33, 226, 212, 247, 6, 59, 1
450 DATA 1, 0, 116, 168, 161, 61, 1, 187, 208, 0
460 DATA 137, 7, 131, 195, 2, 161, 63, 1, 137, 7
470 DATA 180, 16, 186, 192, 0, 205, 33, 186, 128, 0
480 DATA 205, 33, 186, 128, 0, 180, 26, 205, 33, 180
490 DATA 18, 186, 92, 0, 205, 33, 60, 0, 117, 3
500 DATA 233, 206, 254, 195

```

Figure 2: Type in and run this BASIC program to produce MOVE.COM.

PROGRAMMING

random record number in the File Control Block (see Figure 1) to 12 and then execute DOS function call 34. In BASIC, you say PUT #1,12. If the record size you

have chosen is 64, then the first 64 bytes of the Disk Transfer Area are written into the file whose FCB you're using, and they become record number 12.

Sequential files are similar except that a different set of DOS function calls is used to do the reading and writing. DOS keeps track of the record numbers for you when you're using sequential files, so you don't have to worry about them. Record numbers are calculated differently than with random files, however. "Blocks" of records are used, each block being 128 records long. The record length, however, is just what you set it to. The "current block" in the FCB, together with the "current record" (see Figure 1 for both) inside that block, gives DOS the record number. Otherwise, as far as the File Control Block is concerned, there is no difference between sequential and random access files.

You now know how to use everything in a FCB that DOS officially allows you to use. I'll shortly take just a few liberties with DOS's private "reserved area" to add the final flourishes to Move. Seeing how this is done will give you an idea of what you can do with some initiative.

Back to the Program

When you write to disk, the number of bytes you specify as the record size is read from the Disk Transfer Area (the DTA buffer) and whizzed out to disk. In order to read and write as quickly as possible, you want the DTA to be as large as possible. Move is a .COM file (see Figure 2), and when DOS loads a .COM file into memory, it takes an entire segment (64K) under its control. The program is placed at the bottom of the segment, and the stack that DOS uses is at the top, but all the rest of the segment is available. A 32K DTA in this area, starting right after the program, is perfectly feasible. (See the source code for Move in Figure 3.) Even though it's outside the area we think of as the program, this buffer area is still inside the segment DOS makes available. Whatever is read or written, it's the 32K DTA buffer space after the program that will be read into or written from.

Naturally, of course, not all the files you'll want to read and write come in 32K

85 REASONS TO CALL IN 1985!

FLOPPY DISK DRIVES

TANDON TM 100-2 (DS/DD) ... \$160
CDC (DS/DD) ... 150
SAC 386 1/2 height ... 130
PANACHE 1/2 height ... 130

HARD DISK DRIVES

SHUGART (interior 10mb) ... \$799
ALPHA OMEGA TURBO 10 (interior 10mb) ... 799
PERIGRUS 10mb 23mb 40mb 50mb 140mb ... 2295
OMEGA 30mb ... 3895

MONITORS

AMDEK 300A/G ... \$149.95
AMDEK 300A ... 175
PDS 1012 ... 449
PDS 8112 ... 449
PDS 8112 ... 449
QUADRON QUADRON II ... 429
QUADRON AMBERCHROME ... 169
3000 (all models) ... CALL

MONITOR INTERFACE CARDS

PLANITRONICS COLOR ... \$399
PC PEACOCK ... 219
PARADISE MODULAR GRAPHICS ... CALL
PARADISE MULTI-DISPLAY ... CALL
HERCULES GRAPHICS ... 329

HERCULES COLOR

MONITOR (C.P.S.) ... 215
QUADRON QUADRON I ... 215
REYES MONOCHROME ... 169
REYES COLOR ... 169
REYES II ... 169
REYES GRAPHICS MASTER ... 449
REYES GRAPHICS EDGE ... 399

MULTI-FUNCTION BOARDS

AST SERAPLUS w/side ... \$209
QUADRON QUADRON w/side ... 209
TECHNICAL CAPTAIN w/side ... 169
CROCHET PC BIOSROM ... 399
APPARAT 256A/128 ... CALL
64K RAM UPGRADE ... 39
256K RAM Card Set ... 125

MODEMS

HAYES SMARTMODEM 1200 ... \$499
HAYES SMARTMODEM 1200B ... 399
HAYES SMARTMODEM 300 ... 199
NOVATION MODEMS ... CALL
SIGNAUMAN MARK VI ... 129
SIGNAUMAN MARK VI ... 129
ANCHOR VOXMODEM ... 79
RITCH (ALL MODEMS) ... CALL

SOFTWARE

LOTUS 1-2-3 ... \$119
SHRIMP ... \$119
Office II ... \$119
Office II ... \$119
MICROSTAR PRO ... 399
WINGSTAR 2000 ... 399
OPEN ACCESS ... CALL

MISCELLANEOUS

KEYTRONICS 315M ... \$149
MICROSOFT MOUSE ... 139
PC MOUSE ... 129

PRINTERS

DEKRA 82 ... \$299
DEKRA 83 ... 549
DEKRA 84 ... 399
DEKRA 92 ... 999
DEKRA 93 ... 999
EPSON SX 80 ... 349
EPSON SX 80PT ... CALL
EPSON SX 100 ... 415
EPSON FX 80 ... 429
EPSON FX 100 ... 429
EPSON LQ 1500 ... 1139
GENIE 121 ... 399
GENIE 151 ... 399
DARLO (ALL MODELS) ... CALL
EPSON (ALL MODELS) ... CALL
TOSHIBA 1340 ... 749
TOSHIBA 1551 ... 1399
QUICK (ALL MODELS) ... CALL
NEC (ALL MODELS) ... CALL
SILVER REED 400 ... 329
SILVER REED 500 ... 339
SILVER REED 580 ... 439
SILVER REED 770 ... 799

Please call for current prices. Dealer inquiries welcome. Qualified purchase orders accepted.

1/800/631-6993
(FOR ORDERS ONLY)

1/404/953-0088
(INFORMATION AND
TECHNICAL SUPPORT)

MASTERCARD
VISA
ACCEPTED

CALL TODAY ...
404/953-0088

PC
Warehouse

2800 Delk Road
Marietta, Georgia 30067

CIRCLE 499 ON READER SERVICE CARD

PROGRAMMING

blocks. If, for example, you copied a 98-byte-long file, it would be rather silly to write it out with a length of 32,678 bytes (32K). Reading the file with that large a DTA is still fine, since DOS fills the other bytes with zeroes (and tells you when you've read past the end of the file); writing, however, is another story. You want

to write the most material you can at one time so that you can copy as fast as possible, but it turns out that there's a real limit to how much Move (or a program of your own) can write out at once. This limit is set by the delicate way DOS keeps track of its files and their sizes. If you try to write a small file using a big record size,

DOS loses track of it.

File Watching

Files are given space on the disk by DOS in what it calls clusters. For double-sided disks, a cluster consists of 1,024 bytes, or 1K. This is the smallest amount of space that DOS will allocate for any file

```

CODE_SEG      SEGMENT
ORG           100H                ;ORG 100H for a .com file
ASSUME        CS:CODE_SEG,DS:CODE_SEG
FIRST:        JMP     ENTRY        ;Skip over data area
COPYRIGHT     DB      '(C) S. HOLZNER 1984'
TARGET_FCB    DB      37 DUP(0) ;FCB at 6CH will be written over
END_FLAG      DW      0           ;Flag set after everything read
FILE_SIZE_LO  DW      0           ;Low word of file size, in bytes
FILE_SIZE_HI  DW      0           ;High word of same
FILE_SIZE_K   DW      0           ;Number of Clusters to write
DTA_OFFSET    DW      0           ;Used for 1K increments into DTA
COPY_MSG_1    DB      13,10,'Copy $' ;Part 1 of the copy prompt
COPY_MSG_2    DB      ' (Y/N)?$'    ;And part 2
FULL_MSG      DB      13,10,'Disk Full$' ;Trouble message

MOVE          PROC      NEAR
ENTRY:        MOV      CX,32        ;The main (and only) procedure
MOV          SI,6CH                ;Copy over 1st 32 bytes of default DTA
LEA          DI,TARGET_FCB        ; from 6CH into Target_FCB area for
REP          MOVSB                ; later use as new file name

MOV          DX,5CH                ;The source FCB
MOV          AH,11H                ;Check if there is match to source file
INT          21H
CMP          AL,0FFH                ;0FFH -> No match
JNE          QUERY                ;Match
JMP          OUT                    ;No Match
QUERY:        MOV      AH,9H        ;Print out prompt message
LEA          DX,COPY_MSG_1
INT          21H
MOV          CX,11                  ;Print out 11 letters of found file name
MOV          BX,81H                ;Point to match in default DTA
MOV          AH,2
QLOOP:        MOV      DL,[BX]      ;Get letter of found file's name
INC          BX                    ;Point to next letter
INT          21H
LOOP         QLOOP                ;Keep going until all 11 printed
LEA          DX,COPY_MSG_2        ;Print out 2nd half of prompt message
INT          21H
MOV          AH,1                  ;Get a 1 character response
INT          21H
CMP          AL,'Y'                ;Was it a 'Y'?
JE           DO_COPY              ;Yes, copy the file
CMP          AL,'y'                ;No...perhaps a 'y'?
JE           DO_COPY              ;Yes, copy the file
JMP          NEXT                 ;Get next match (if none, leave)
DO_COPY:      MOV      CX,37        ;Using given target file as a template,
LEA          SI,TARGET_FCB        ; load its 37 characters into the FCB

```

Figure 3: Assembly language source code for MOVE.COM. (Listing continues on following two pages.)

PROGRAMMING

on a (double-sided) disk. Thus, if you have a full disk and delete a file only 12 bytes long, you'll find that you've freed an entire 1,024-byte cluster. Similarly, if you write a 12-byte file, it will be allocated a 1,024-byte cluster even though it uses only the first 12 bytes.

To keep Move simple, I chose to stick

with a 1K record size. So while Move is able to read in healthy 32K-byte blocks, the program writes a more sedate 1K at a time, patiently emptying the Disk Transfer Area. It certainly could have been fancier (by, say, writing bigger chunks depending on file size), but the program had to be kept reasonably short so you could type it

into your PC. DOS 2.0 and 2.1 fans may realize that all this can be handled at once more succinctly and neatly by some of the advanced file-handling abilities provided by these versions. But Move is supposed to work with all DOS versions.

There is still one awkward contretemps. Having written out a 12-byte file,

```

MOV     DI,0C0H                ; for use as real target FCB, checking
CMP     BYTE PTR [SI+1], ' '   ; for wildcards. First, was DRIVE: given
JNE     NLOOP                  ; as target? No, check wildcards.
PUSH     DI                     ; Yes, fill Target_FCB with wildcard '?'s
PUSH     CX                     ; so found filename will be used
LEA     DI,TARGET_FCB
INC     DI
MOV     CX,11                   ; Put in 11 '?'s
MOV     AL,'?'
REP     STOSB                   ; Do the fill
POP     CX                       ; Restore counter and dest. pointer
POP     DI
NLOOP:  MOV     BX,0             ; Move given target name into real used
CMP     BYTE PTR [SI],'?'      ; target FCB at 0C0H. If a wildcard is
JNE     CHAR_OK                ; found in given filename use corres-
MOV     BX,80H                 ; ponding character in found filename
SUB     BX,OFFSET TARGET_FCB   ; Wildcard found, adjust source (SI) to
ADD     SI,BX                   ; point to the found filename
CHAR_OK: MOV     SI,[DI],[SI]    ; Restore SI if necessary
SUB     SI,BX                   ; Loop back until for all 11 name char.s
LOOP    NLOOP
MOV     DX,80H                 ; Target FCB now at 0C0H, source at 80H
MOV     AH,0FH                 ; Use DOS service 15 to open source
INT     21H                    ; Open source FCB
MOV     DX,0C0H                ; Use DOS service 12 to create target
MOV     AH,16H
INT     21H
AND     END_FLAG,0             ; Create target FCB (or if the file
MOV     BX,80H + 14             ; already exists, zero it and refill it)
MOV     WORD PTR [BX],8000H     ; Set record size for source (32K)
MOV     BX,80H + 16             ; Get file size from opened source FCB
MOV     AX,[BX]
MOV     FILE_SIZE_LO,AX        ; Store low word of size in FILE_SIZE_LO
ADD     BX,2                    ; Point to high word
MOV     DX,[BX]
MOV     FILE_SIZE_HI,DX        ; Store high word of size in FILE_SIZE_HI
MOV     CX,1024                 ; Div DX:AX (High:Low of size) by 1024
DIV     CX
MOV     FILE_SIZE_K,AX          ; Get file size in rounded-up K (1024)
TEST    DX,0FFFFH              ; Was it an even K file: Mod(size,1024)=0?
JZ      ROUND                  ; Yes, don't add cluster for file remnant
INC     FILE_SIZE_K             ; No, add 1 more cluster for remainder
ROUND:  MOV     WORD PTR [BX],400H ; Set record size for target (1K)
READ:   LEA     DX,DATA_POINT    ; Set up the 32K DTA we'll use
MOV     AH,1AH                 ; at the end of this program
INT     21H
MOV     DX,80H                 ; Point to source FCB to prepare for read
MOV     AH,14H
INT     21H                     ; Do the read of 32K bytes

```

PROGRAMMING

and therefore one record, DOS realizes that the record size used was 1K and so confers on the file a length of 1,024 bytes instead of 12. To fix this, you use the simple expedient of putting the file size in the File Control Block before you close it. That way, though the allocation for the file is 1,024 bytes, DOS will know that the file

itself is really only 12 bytes long. The actual file size (in bytes) is easy to find if you look at an actual opened FCB, for it turns out to be the very first two words of the DOS "reserved area." So I simply made Move jump over the figurative fence, so to speak, and copy the source file's size to the new file's FCB. In this

way, when DOS closes the file, it then registers the correct size.

A number of other details, such as the use of wildcards and a "Disk-full" error message, are handled within MOVE.COM but would require too long an explanation here. The curious (or intrepid), can refer to Figure 3. ■

```

        CMP     AL,0           ;AL = 0 if end of file not yet reached
        JLE     READ_OK
        OR      END_FLAG,1
READ_OK: MOV     CX,20H        ;Have read in the whole file, DTA is
                                ; stuffed with zeroes after end of file
        LEA     DX,DATA_POINT ;Reset our offset into 32K DTA to the
        MOV     DTA_OFFSET,DX ; start
WLOOP:  MOV     DX,0C0H        ;Point to target FCB, prepare for write
        MOV     AH,15H
        INT     21H           ;Do the write 1K at a time
        CMP     AL,0           ;Was the write a success?
        JE      COPY_OK        ;Yes, check if done writing
        LEA     DX,FULL_MSG     ;No, assume the disk was full and say so
        MOV     AH,9H
        INT     21H           ;Print error string
        JMP     OUT            ;Exit
COPY_OK: DEC     FILE_SIZE_K    ;Decrement number of clusters to write
        JZ      FINISH         ;Done?
        ADD     DTA_OFFSET,400H ;No, point to next 1K chunk of DTA
        MOV     DX,DTA_OFFSET
        MOV     AH,1AH
        INT     21H           ;Set DTA to match
        LOOP    WLOOP          ;Repeat until 32K written or end of file
        TEST    END_FLAG,1     ;Have we read in the end of file?
        JZ      READ          ;No, get next 32K block from source
FINISH: MOV     AX,FILE_SIZE_LO ;Now adjust written file's size
        MOV     BX,0C0H + 16   ;Point to low word of size
        MOV     WORD PTR [BX],AX ;And set it to the correct value
        ADD     BX,2           ;Point to high word of size
        MOV     AX,FILE_SIZE_HI ;And set it too
        MOV     WORD PTR [BX],AX
        MOV     AH,10H
        MOV     DX,0C0H
        INT     21H           ;Request DOS service 16, close files
        MOV     DX,80H        ;Point to target file's FCB
        INT     21H           ;Close target with correct size
        MOV     DX,80H        ;Point to source file's FCB
        INT     21H           ;Close source
NEXT:   MOV     DX,80H        ;Start looking for the next match
        MOV     AH,1AH        ;First, reset DTA to 80H for found file's FCB
        INT     21H
        MOV     AH,12H
        MOV     DX,5CH
        INT     21H           ;Now search for next match-service 18
        CMP     AL,0           ;Use given filename to match to
        JNE     OUT            ;Match found?
        JMP     QUERY          ;No, exit.
        ;Yes, ask if it should be copied
OUT:    RET

MOVE     ENDP
DATA_POINT:
CODE_SEG     ENDS
END      FIRST
;The 32K DTA starts here
;END FIRST' so entry point set to FIRST
    
```



STOP SOFTWARE PIRACY...

... with one of our new, sophisticated copy prevention programs.

for Disk Security

- PADLOCK II*
- COUPON*
- PC PADLOCK

*Preformatted & Protected Disks

for Data Security

- DATA PADLOCK
- PC CRYPT

for Telecommunication Security

- PRIVATE TALK

Why should your valuable data or useful software program become available in the Public Domain?



Call or write for more information.

GLENCO ENGINEERING INC.
3920 Ridge / Arlington Hts., IL 60004
(312) 392-2492

EDITED BY PAUL SOMERSON

User-to-User

PC readers use this forum to help one another by passing along their questions, solutions, comments, and complaints.



Hex Strings

I often find myself using *DEBUG* to change messages that appear onscreen. The process is trivial; all you have to do is substitute one set of letters for another. But converting strings of letters into their hexadecimal values can be tedious. *BASIC*'s *HEX\$* function and *MID\$* stripper make it easy. The *BASIC* *HEXASCII* program in Figure 1 takes up to 255 characters that you type in and lists their hex values. Then you can go into *DEBUG* and use the *E* command and the space bar to enter the values. Okay, it's a simple program, but it often comes in handy.

Let's say you became tired of the "The IBM Personal Computer DOS" message that greets you every time you wanted to turn your machine on (and don't use an

AUTOEXEC.BAT) and wanted to replace it with something that had the same exact number of letters, such as "Beam me outta here now Scotty." Before you do anything else, copy your *COMMAND.COM* file as *C.COM*, hitting the Enter key at the end of each line:

```
A>COPY COMMAND.COM C.COM
```

To put in the new message, start by running *HEXASCII* to translate the "Scotty" line into pairs of hex characters. If you don't want to have to write down all the hex values, either change the *PRINTs* in *HEXASCII.BAS* to *LPRINTs* or hit Shift-Print to get a printout of it as it appears on your screen.

Then find the place in *COMMAND.COM* where the old string was stored. To do this—make the patch itself—use *DEBUG*. Make sure *DEBUG.COM* is on your disk, and type in

```
A>DEBUG COMMAND.COM
```

(Later, replace *COMMAND.COM* in this example with whatever file you are going to customize.) Find out how long the file is by typing

```
-RCX
```

Remember, the *DEBUG* prompt is a dash, not a greater-than symbol. *DEBUG* will print the length as soon as you hit the Enter key. Hit Enter a second time, since

USER-TO-USER

DEBUG is offering you the option to change the record of the file's length, which you don't want to do. Add hex 100 to the length, since DEBUG loads files at &h100 rather than at &h0. Let's say DEBUG told you the length was &h561A (which it is for DOS 3.0); just add &h100 to get &h571A.

Then make the search by typing, at the prompt,

```
-S 100 571A "The IBM Personal Computer"
```

and then hitting Enter. DEBUG will print out eight hex digits separated by a colon. Ignore the first four, since they vary depending on how much memory your machine has. The last four represent the local address of the text you want to replace. For DOS 3.0, the rightmost four digits will be 1072. Now, to start entering the new text, just type

```
-E 1072
```

and hit the Enter key. The screen will print another group of eight digits and then a two-digit number followed by a period. This number is the hex value of the first letter you want to replace. Type in the first new two-digit number that you produced HEXASCII.BAS. DON'T HIT THE ENTER KEY. Instead, hit the space bar. You'll see another two-digit number appear. Enter your second new number and hit the space bar again. After you've entered the last new two-digit number, hit the Enter key, then hit W (and Enter) to write

the new file and Q (and Enter) to quit.

Now, when you boot up, you'll see your new message. However, you shouldn't disfigure your COMMAND.COM, so put things back the way they were. It's always a good idea to make COMMAND.COM the first nonhidden file on your disk. (This assumes you made a copy of COMMAND.COM called C.COM as mentioned above.) To do this, type the following lines in order, hitting the Enter key at the end of each:

```
A>DEL COMMAND.COM
A>COPY C.COM COMMAND.COM
A>DEL C.COM
```

This technique can be very useful if you're trying to change a help screen or make an onscreen message clearer or easier to understand. Be careful not to make the new message longer than the old one. You can make the new message shorter by adding spaces (hex 20s) at the end so that the length of the new string plus the added spaces is exactly the same as the length of the old string.—P.S.

Global FIND

The only problem with the DOS 2.x command FIND is that you cannot use global filename characters in specifying the names of the files you want searched. Sometimes you want to search all the files on a disk for a particular string, and entering all the filenames is a bother.

One way to avoid entering all the filenames is to use the FOR command. If

```
100 * HEXASCII.BAS -- Converts ASCII strings to hex
110 LINE INPUT "Enter ASCII string to convert: ",T$
120 PRINT:IF LEN(T$)<27 THEN S$=T$:GOTO 140
130 S$=LEFT$(T$,26):T$=RIGHT$(T$,LEN(T$)-26)
140 FOR A=1 TO LEN(S$)
150 PRINT MID$(S$,A,1);STRING$(2,32);
160 NEXT:PRINT
170 FOR A=1 TO LEN(S$)
180 PRINT HEX$(ASC(MID$(S$,A,1)));CHR$(32);
190 NEXT:PRINT
200 IF T$=S$ THEN END ELSE 120
```

Figure 1: BASIC HEXASCII.BAS program to convert strings of normal text into their hex values so that they can be entered into programs with DEBUG. Change the PRINTs to LPRINTs if you want a printed copy of the conversion.

JDR DELIVERS QUALITY FOR LESS!

DISKETTE FILE

\$8.95

WITH PURCHASE
OF 50 DISKETTES
\$9.95 IF
PURCHASED ALONE
HOLDS 70 5 1/4"
DISKETTES



NASHUA DISKETTES

5 1/4" SOFT SECTOR
DS/DD BULK PACKAGED
\$139.95 **\$149.95** **\$159.95**
QTY 250 QTY 100 QTY 50

BMC BX-80 PRINTER

80 CPS DOT MATRIX PRINTER
• BI DIRECTIONAL
• SUPERB GRAPHICS
• CENTRONICS INTERFACES
\$199.95
CLOSE-OUT SPECIAL. QUANTITIES LIMITED

ORDER TOLL FREE
800-538-5000
800-662-6279 (CA)



PROTOTYPE CARDS

• FR 4 GLASS EPOXY LAMINATE
• GOLD CARD EDGE CONNECTORS
• SILVER SOLDERED LEADERS FOR ALL SIGNALS
• INCLUDES BRACKET AND MANUAL
IBM PR-1 WITH LINES FOR -5V & GROUND **\$29.95**
IBM PR-2 (PICTURED ABOVE) **\$27.95**
AS ABOVE WITH DECODING CIRCUITRY

IBM COMPATIBLE POWER SUPPLIES

130W \$159.95
XT COMPATIBLE
SWITCH ON SIDE
FITS IBM CASE
1 YR WARRANTY
REAR SWITCH MODEL
FOR IBM COMPATIBLES
100W \$99.95 130W \$129.95

4164-200 9/\$24.95
8087-3 \$129.00

DISK DRIVES

TEAC FD-55B **\$129.95**
HALF HEIGHT DS/DD
MPI 852 **\$109.95**
FULL HEIGHT DS/DD
TANDON TM100-2 **\$159.95**
FULL HEIGHT DS/DD

OTHER ACCESSORIES

MAXIMIZER **\$259.95**
SIMA MULTIFUNCTION CARD
HAYES SMARTMODEM **\$419.95**
1200B FOR IBM
PRINTER CABLE **\$19.95**
PARALLEL 6' SHIELDED CABLE
KRAFT JOYSTICK **\$39.95**

CALL FOR A FREE CATALOG

JDR Microdevices

11224 E. Robinson Avenue, San Jose, CA 95138
800-538-5000 • 800-662-6279 (CA) • (408) 995-5430
FAX (408) 275-5415 • Telex 171-110
Copyright 1985 JDR Microdevices

CIRCLE 104 ON READER SERVICE CARD

How to teach your kids about the IBM PC.

Computers for Kids teaches children age 8 and older to write their own programs in less than an hour—without the necessity for previous knowledge of algebra, variables, or computers. And there's a special section that keeps parents and teachers on the same successful command path.

Starting off with an easy-to-understand explanation of how to use the IBM PC, your kids will progress quickly to flow charts and simple print programs...to loops, graphics, and other programming concepts that show the young user how to make the PC do exactly what he wants—in non-technical language that makes life easier for both of you.

So do your children a favor.

Do yourself
a favor.
Order the
PC edition
of *Computers for
Kids* today!



Creative Computing Press

Dept. 777C 39 East Hanover Avenue
Morris Plains, NJ 07950

Send me ☐ *Computers for Kids*, PC edition, at \$5.95 plus \$1.50 postage and handling each. #12K

☐ **PAYMENT ENCLOSED**
Residents of CA, NJ and NY state add applicable sales tax. Outside USA add \$3.00 per order.

☐ **CHARGE MY:** (Charge and phone order \$10 minimum)
☐ American Express
☐ MasterCard ☐ Visa

Card No. _____ Exp. Date _____

Signature _____

Mr./Mrs./Ms. _____
(Please print full name)

Address _____ Apt. _____

City _____

State/Zip _____

☐ Send me a FREE Creative Computing Catalog.

USER-TO-USER

FIND.EXE is in drive A:, and the disk you want to search is in B:, the following command, which must be executed as part of a batch file, will search all the files on B: for the string "your generous offer":

```
FOR %%F IN (B:.*.*) DO FIND
"your generous offer" IN %%F
```

This command executes quickly, but it can go much faster if the files being searched are on a RAMdisk. Also, since FIND is an external command, it is loaded every time the command is executed, so FIND should be on a RAMdisk.

There is one problem to be solved; when FIND examines itself, it sends the PC into never-never land and has to be rebooted. So FIND should be in a different subdirectory. As a remedy, I create a subdirectory named VFINDSD and copy FIND.EXE into it. Then I make the root directory the default directory, copy the following batch file into it, and, finally, execute the batch file

```
ECHO OFF
PATH VFINDSD
FOR %%F IN (*.*) DO FIND
"your generous offer" IN %%F
```

Michael Trombetta
Manhasset, NY

Good trick. Note, however, that I was able to use this (on my PC AT) with FIND.EXE on the same subdirectory as the one I was searching, without experiencing any hangs. DOS batch files are getting better and better; I can't wait for what's coming next.

DOS Menu Magic

If you use DOS 2.x or higher and have ever abandoned a great batch file idea for lack of a way to direct execution based on user input, you'll love this. When invoked

If you ever
abandoned a great
batch file for
lack of a way to
direct execution,
you'll love
GETKEY.COM.

from within a batch file, the 8-byte GETKEY.COM utility will return the ASCII value corresponding to a single keystroke. This value can then be tested with the batch IF ERRORLEVEL facility.

You can create GETKEY.COM easily using DEBUG (see Figure 2). Be sure DEBUG.COM is on your disk, and type in everything underlined. One important thing to keep in mind is that the batch test IF ERRORLEVEL .xx will be considered true if xx is less than or equal to the GETKEY return code. It is therefore necessary to compare the return code to its possible values in reverse-ASCII order. Copy BASIC.COM and BASICA.COM to your disk if you wish to test the sample MENU.BAT file in Figure 3.

Jacques Bensimon
Stamford, CT

```
A>DEBUG
-E 100 B4 00 CD 16 B4 4C CD 21
-N B:GETKEY.COM
-R CX
CX 0000
:8
-W
Writing 0000 bytes
-Q
```

Figure 2: Instructions for creating GETKEY.COM using DEBUG. Type in everything underlined. GETKEY.COM returns the ASCII value for any keystroke.

USER-TO-USER

```
ECHO OFF
:BEQ
CLS
ECHO -----
ECHO 1 - Run Basic
ECHO 2 - Run Advanced Basic
ECHO 3 - Return to DOS
ECHO -----
:ASK
ECHO Hit 1, 2 or 3
GETKEY
IF ERRORLEVEL 52 GOTO ASK
IF ERRORLEVEL 51 GOTO K3
IF ERRORLEVEL 50 GOTO K2
IF ERRORLEVEL 49 GOTO K1
GOTO ASK
:K1
BASIC
GOTO BEQ
:K2
BASIC
GOTO BEQ
:K3
ECHO OK!
```

Figure 3: Sample MENU.BAT batch file that uses GETKEY.COM, to direct file execution based on user input. Be sure MENU.BAT, BASIC.COM, and BASICA.COM are on the same disk when you try this.

Thanks for this very simple, exceedingly useful trick. The only thing users may want to add is a series of IF EXISTS to better inform the user if one of the menu selections is not on the disk. See Figure 4 for a sample addition that checks if BASIC.COM is on the disk. To use this addition, put it between the lines :K1 and BASIC in the MENU.BAT file.

Toss Your Tractor

As I read Peter Norton's column in the special printer issue of PC Magazine (Volume 3 Number 23), I wondered if Norton and I are the only two people in the world using Microsoft's Word and a Daisywriter 2000 with a cut-sheet feeder. Norton

didn't mention any sheet feeder problems, so I will.

Microsoft says it's "best" to have the Daisywriter emulate a Diablo 630. (At least, the local Microsoft rep says that Microsoft says so.) That works fine with tractor feed and with Word's "Printer Option feed: Continuous."

When I added a Daisywriter DSF-2 sheet feeder, I set the Daisywriter's switches according to the manual (T1 and T2 ON), and, because I was using single bin, selected Word's "Printer Option feed: Bin 1." I began getting numbers in the upper-left corner of the first page, spurious characters along with page numbers, and a top margin that varied from 2 inches for the first sheet to 0 by the fourth.

Apparently Word sends special sheet-feeder controls to the Diablo 630 (and to all the other supported impact printers), while Daisywriter uses two DIP switches to do the same thing. Thus set up, the Daisywriter thinks that it is getting continuous feed paper and acts accordingly. Word, on the other hand, thinks that it's talking to a Diablo with a sheet-feeder and sends extra control sequences that the Daisywriter neither needs nor wants.

I talked with Microsoft's local representative; with the importer, Computers International, Inc., in Los Angeles; with Honeywell Services in both Atlanta and Columbus; and with three different local dealers. Almost everyone was courteous, sympathetic, and of no help whatsoever in resolving the problem.

In case anyone out there with a Daisywriter and Microsoft's Word is thinking about adding a sheet feeder, do it. Norton is right; throw the tractors away. But make sure the Daisywriter knows which sheet-

VICTORY CAN BE YOURS ON THE ELECTRONIC BATTLEFIELD WITH SORCERERS & SOLDIERS



Conquest and glory are within reach when you learn the concepts, rules and winning strategies behind computer adventure games with Sorcerers & Soldiers.

Daring and game-winning moves will be your trademark as you learn to think as devilously as the people who write these fantasy, war and role-playing computer games.

Sorcerers & Soldiers provides descriptions, tactics and even hardware requirements for popular games plus an extensive glossary of adventure terminology.

Order your copy today. Also available at your local bookstore and computer store.

For faster service call toll free
9 am-5 pm
E.S.T. 1-800-631-8112. (In NJ only 201-540-0443).



Creative Computing Press
Dept. rroc, 36 East Hanover Avenue
Morris Plains, NJ 07950

Please send me _____ copies of Sorcerers & Soldiers at \$9.95 plus \$2.00 postage and handling (\$5.00 outside USA) each. #79-8

☐ Payment enclosed \$_____
*Residents of CA, NJ and NY State add applicable sales tax.

Charge my:
☐ American Express ☐ Visa ☐ MC

Card No. _____

Exp. Date _____

Mr./Mrs./Ms. _____

Address _____ please print full name

City _____

State/Zip _____

☐ Please send free catalog.

```
IF EXIST BASIC THEN GOTO B1
ECHO BASIC.COM IS NOT ON THIS DISK
PAUSE
GOTO :BEQ
:B1
```

Figure 4: Sample addition to print a message if BASIC.COM is not on the disk. Put this between the :K1 and BASIC lines in the MENU.BAT batch file.

USER-TO-USER

feeder it has (there are two different models with different switch settings). And, what's more, make sure that Word thinks the Daisywriter has tractors! You can then use Word's "Format Division" or a style sheet to "fine tune" top and bottom margin settings and get perfect printouts every time.

J. Brooks Breeden
Columbus, Ohio

Again, we're dealing with a standardization problem. Actually, PC Magazine hears more problems about printer standardization than any other kind. It's really annoying to watch a printer do things like throw in extra form feeds, ignore tabs, print at the wrong end of the platen, and draw bizarre borders. The real standard at this point is IBM's, and every printer out there should be capable of emulating

it. The truth is, very few are.

While it would be hard for every software manufacturer to know how every printer is set up with every peripheral, there would be far less of a problem if software and hardware manufacturers got together and hammered out some rigid standards. But n-o-o-o-o-o.

VERTICAL.BAS

While working on a project to print blank forms, I needed a method of putting vertical headings on the screen in order to enhance my forms. VERTICAL.BAS (see Figure 5) contains a subroutine built into a small demo to show this can be done.

The routine will not generate an error if the variable is longer than will fit on the screen. There is no checking done other than this, so you could tell it to print at an

invalid row or column and thus generate a syntax error.

Bob Schmidt
Columbia, MO

You can use variations on this technique to print slanted, angled, alternated, and generally unusual headings to spruce up your forms if this is important to you.

Share Your Discoveries

Tell the world about your latest discovery through User-to-User, and we'll pay you \$50 for your trouble, plus an extra \$25 if you submit it on a disk.

If you send a disk, please include a printout of your submission to ensure against damage in transit. Mail your contributions to: User-to-User, PC Magazine, One Park Avenue, New York, NY 10016. ■

```
1000 ' VERTICAL.BAS
1100 '
1200 ' Purpose is to define a function to print a string variable on the
1300 ' vertical starting at the location pointed to as defined below:
1400 '
1500 ' VNAME$ is the string to be printed
1600 ' VROW is the row number (1-25)
1700 ' VCOL is the column number (1-80)
1800 '
1900 KEY OFF : CLS
2000 LOCATE 1,1 : INPUT "NAME ";VNAME$ : LOCATE 1,1 : PRINT SPACE$(39);
2100 LOCATE 1,1 : INPUT "ROW ";VROW : LOCATE 1,1 : PRINT SPACE$(39);
2200 LOCATE 1,1 : INPUT "COL ";VCOL : LOCATE 1,1 : PRINT SPACE$(39);
2300 GOSUB 65100
2400 GOTO 2000
65000 ' -----
65100 ' Subroutine to print vertical
65110 FOR VPOINT = VROW TO VROW + LEN(VNAME$)
65120 IF VPOINT > 25 THEN 65150
65130 LOCATE VPOINT, VCOL
65140 PRINT MID$(VNAME$, VPOINT-(VROW-1), 1);
65150 NEXT
65160 RETURN
```

Figure 5: VERTICAL.BAS program to generate vertical headings.

What's MOM up to now?



Bulletins from MOM...

MOM knows more about the Micro to Mainframe Link than anyone around. Whether it's IBM or non-IBM micros. An ASCII CRT or printer? MOM has simple solutions to interface micros into the IBM mainframe world. Or to expand your personal computer.

PC/COM... Micro to mainframe host interface system to manage and transfer files. Newest 3.5 and 4.0 versions are compatible with twenty different emulation

products, enhanced for virtual diskettes, record and field selection, security logs and more. **IRMA...** Hottest scoop is IRMA will soon do windows and release a DFT board.

SNA BOARD WITH PC/COM... MOM has the only micro to mainframe host transfer remote.

MAX... Removable cartridge disk drive available for the AT and Macintosh as well as other IBM and Apple micros.

PC/SECURE... The industry standard for PC or XT security.

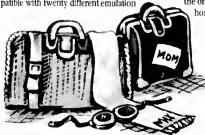
Q TIME... MOM's newest software system provides a user interface to data base on both micro and mainframe. **AT&T...** MOM has been personally selected to market the exciting AT&T microcomputer products. That's great news! **WORLDWIDE DISTRIBUTION...** MOM now has offices in Rio de Janeiro and Paris, as well as her headquarters in the U.S. Call or write MOM for further details. Toll Free (800) 241-1170 or (404) 351-2902.

MOM still knows best.

MOM™

Specialist in Marketing Micros to Mainframes
A Division of N.P.M., Inc.

Two Northside 75
Atlanta, Georgia 30318
800-241-1170/404-351-2902
Telex—293842 BREX UR



MOM, PC/COM, PC/Secure, MAX and QTIME logos are trademarks of National Product Marketing, Inc.

CIRCLE 530 ON READER SERVICE CARD

PC Tutor

TV and RGB

Q: I've recently heard about several display units that combine the functions of an RGB monitor with those of a regular color



TV set. How can I confidently determine whether their video quality is adequate for use with my PC?

*Jonathan Marx
Columbus, Ohio*

A: The best thing to do, if possible, is to borrow the display and try it, or to purchase it with the understanding that you can return it if you're not satisfied. Your satisfaction will depend on what level of performance your applications require, which could be divided into three broad categories.

- (1) If you already have a good monochrome monitor and will be using the TV strictly for color graphics or if you are willing to work only on a 40-column-wide display, your requirements are not demanding.
- (2) If you insist on having an 80-column-wide display but are still primarily interested in color graphics or simple BASIC programming, your needs can be called demanding.
- (3) Finally, if you do a lot of text editing or spreadsheet analysis, your requirements

are very demanding.

Let's start by evaluating the units in terms of published specifications. The first ratings to look at are the horizontal and vertical resolution. Horizontal resolution is expressed in terms of the number of displayable dots across the screen; vertical resolution is often expressed as so-many "lines," since this represents the number of scan lines in each displayed screen.

To use the PC color card in its character mode, you should be able to distinguish 320 dots (pixels, or "picture elements") horizontally for a 40-column-wide display and 640 dots horizontally for 80 columns. You also need to have 200 displayable vertical (scan) lines. Most monitors won't have any trouble with the 200-line vertical requirement; the horizontal resolution is generally the problem. Fortunately, you will find that, except for very demanding applications, your combination TV/RGB display need not be rated at a full 640 dots horizontally for 80-column resolution. The IBM color monitor, for example, is rated at about 560 dots.

Most TV/monitor specifications also mention the related question of dot pitch. The pitch is the diameter of each round dot. Using the dot size, you can calculate roughly the maximum horizontal resolution. The IBM color monitor can serve as an example. Measured diagonally, it has a 13" (340mm) screen, and it has a rated pixel size of 0.43 mm. Since most monitors have a width/height ratio of 4/3, this means (from the good old 3-4-5 right triangle theorem) that the diagonal/width ratio is 5/4. Thus, we can expect to find a maximum of $340 \times (4/5) \div 0.43 = 632$ dots across the IBM screen. Since there is always some wasted space between dots and at the screen edge, this brings us back down to the 560-dot rating.

Applying this information in terms of your needs, you will find that in a "not

demanding" application you can probably use just about any high-quality TV. Most will resolve the necessary 200 lines, and graphics in the 320x200 mode will be satisfactory. On the other hand, a demanding application will require nearly the full complement of 640 dots. Thus, even the IBM color monitor is marginal for serious text-editing work, though it is more than adequate for typical business graphics and BASIC programming.

Remember here that we're talking about the new combination RGB monitor/TV sets, not about modified TV receivers. Any regular color set with a so-called composite input (rather than a digital or special RGB analog input) will be totally inadequate for any but the least demanding applications.

The IBM PC puts out a digital RGB signal with 4 outputs: red, green, blue, and intensity. Some digital monitors provide only three (red, green, and blue) inputs rather than the desired 4. This means you will be limited to 8 rather than 16 colors. Worse, you will be unable to distinguish between low and high intensity, which is often disastrous with a text editor.

For each part of a digital signal there are, of course, only two possibilities: ON and OFF. A number of TV/RGB monitors have an analog RGB rather than—or in addition to—a digital RGB input. An analog RGB input means that each of the red/green/blue guns responds to continuous variations in a signal level, which is usually in the general range of 0.1 volt (100 μ V). In analog systems, the greater the voltage, the more intense the color. You can use your PC with such an analog set, but it requires a small add-on circuit card. Some hardware companies sell these cards, particularly for Sony monitors.

One important performance aspect to check is color saturation. When you're in the set's TV mode, tune in a colorful dis-

play (cartoons are an excellent "test signal" for this purpose) and see if the colors look bright. At the same time, make sure they are well defined and don't show a tendency toward streaks of red. While insufficient horizontal resolution won't show up on TV or games, if you intend to use the monitor for very demanding applications, you should check it out with 80-column width text. Inadequate resolution will create a fuzzy appearance, especially with lowercase letters such as *m, n, g, a*, and *e*. One of the sad facts of life is that you may get a brighter TV and game picture from a set that is insufficiently sharp for word processing or spreadsheets. The over-large dot size can give a brighter picture.

There are two additional checks I would suggest. First, run the BASIC sample programs that come with the PC. These are excellent for testing purposes. Make sure the color bar display has all 16 colors. Check the spirals to ensure that lines look solid and well-defined. Next, run your favorite text editor. Make sure that emphasized sections are clearly visible and that text quality is adequate for long-term viewing.

As you will soon learn by experimenting, monitor settings (color saturation, hue, brightness, contrast) can all radically affect the picture. As a general rule, you should lower the brightness as much as is feasible, then adjust the contrast for distinct low and high intensity. For color-saturation adjustments, use an 80-column-wide text display with colored text (this can be generated easily with a BASIC program). Raise the color saturation level until colors are distinct, but not so much that you run into trouble with streaking.

Combination TV/RGB displays are especially appealing for PC users with home offices. [Two of PC's editors are using them for just that purpose.—Ed.] But if you don't wish to pay for a high-resolution color monitor just to use it primarily as a TV set, one low-cost alternative is to purchase a high-quality monochrome monitor as well as an inexpensive

color set. You can then alternately use the monitor for text and the color set for graphics or for applications where color is necessary.

An Interrupt Anomaly

Q: I am using Borland's Turbo Pascal to access all the PC's DOS interrupts and functions. The built-in Pascal procedure INTR lets me load the registers and then call INTR (int#, registers). This works for all the functions and all the major interrupts except interrupt 25h, "Absolute disk read." Running this one produces the message "Memory control blocks destroyed" and creates an urgent need to reboot.

The DOS appendix says only that I should be sure to pop the stack to prevent uncontrolled growth. Can you let us know how interrupt 25h differs from the rest of the pack?

Neil Rubenking
San Francisco, CA

A: For some obscure reason that I can't unravel, INT 25h leaves the original flags on the stack.

When you perform a normal software interrupt, three registers are placed on the stack. First, the flags are pushed, then the IP register, and then the CS register. When an IRET (which stands for "return from interrupt") is performed, the three registers are replaced. Normally, the intent is to have a software interrupt operate completely transparently, including leaving the flags unchanged.

Unfortunately, however, INT 25h returns some information in the flags, so, in an obscure move, IBM decided to leave the original flags register on the stack. A normal calling sequence for INT 25h might then be:

```
... load registers
INT 25h
jc error (carry = error)
popf
... continue
error: popf
... continue
```

In Pascal, you may have a bit more trou-

ble doing this than you expected, since the Turbo INTR routine no doubt assumes that the stack will be back to normal when an interrupt finishes. If you try popping a register in-line, there is no guarantee that the stack will be at the same level as it was during the INTR call. In fact, the damage is probably done inside the INTR function, since it tries to return to a nonexistent address that is determined by your previous flag settings.

This difficulty brings me to an obvious question: Why would you need to use the INT 25h in the first place? Most programs would do well to avoid such an exposed interrupt and rely instead on the normal BIOS read routines. Moreover, since disk formats can span such a wide range, and since DOS has no obligation to stay upwards compatible as regards disk formats, you may find that any program you write using INT 25h may not work on an obscure hard disk, or may not work with the next DOS release. Is using INT 25h worth this limitation?

Big Blue's Open Door

Q: Where can I locate schematics for the IBM PC motherboard and its plug-in adapters?

William Kolesar
Brooklyn, New York

A: The IBM Technical Reference manual, available at IBM Product Centers as well as at authorized IBM dealers, contains a full set of schematic diagrams, as well as commented source code for the ROM BIOS and fairly complete descriptions of the operations of the cards and the motherboard.

Such an open information policy is one of the things that makes the IBM PC so popular.

The PC Tutor solves practical problems and explains points of general interest. If you'd like to see your questions answered here, drop a line to PC Tutor, PC Magazine, One Park Avenue, New York, NY 10016. ■

THE MANUAL:

THE MANUAL:

LOTUS 1-2-3

**A
POCKET-
SIZED
MANUAL**
in alphabetical order.

- APPLE WORKS ■ MULTIPLAN
- dBASE II ■ SYMPHONY
- FRAMEWORK ■ WORDSTAR
- LOTUS 1-2-3

Only **\$14.95** EACH

THE MANUAL
is a compact and
portable reference manual
for people on the go.
Give everyone in your firm
a copy of THE MANUAL.

Lotus 1-2-3 is a trademark of Lotus Development Corp.
Symphony is a trademark of Lotus Development Corp.
dBase is a trademark of Ashton-Tate.
dBase II is a trademark of Ashton-Tate.
Multiplan is a trademark of Microsoft Corp.
Wordstar is a trademark of Micropro Corp.
Apple Works is a trademark of Apple Computer Corp.
The MANUAL is a trademark of Management Information Source, Inc.

PLEASE SEND ME THE FOLLOWING BOOKS:

- ☐ Lotus 1-2-3 \$14.95
- ☐ Symphony \$14.95
- ☐ Frame Work \$14.95
- ☐ dBase II \$14.95
- ☐ Multiplan \$14.95
- ☐ Wordstar \$14.95
- ☐ Appleworks \$14.95

(Corporate discounts available.)

CARD No. _____ Exp. Date _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TOTAL ENCLOSED \$ _____ ☐ VISA ☐ MasterCard

SIGNATURE _____ ☐ AMEX ☐ CHECK

MANAGEMENT INFORMATION SOURCE, INC.

3543 N.E. Broadway, Portland, Oregon 97232

CIRCLE 349 ON READER SERVICE CARD

Spreadsheet Clinic

Questions, hints about spreadsheets? Look for answers and support in this new forum. Devoted to 1-2-3 and Symphony this time, we'll cover other spreadsheets in upcoming issues.

Spreadsheet users have been flooding columns at PC Magazine such as User-to-User with questions and tips about running their software more efficiently and intelligently. Most of the reader responses in this inaugural Spreadsheet Clinic deal with 1-2-3, but we'd like to hear from readers with hints and queries on all brands of spreadsheets. If you have any puzzling spreadsheet questions, clever tips, ingenious hints, shortcuts, powerful macros, undocumented features, bug reports, incisive observations—or comments about the column—send them to us, on a disk if possible. We're very much interested in your reactions.

Reverse to Regular

Here is the patch to Dr. Jeanty's request (User-to-User, Volume 3 Number 19) for switching the highlighted border with the cell address from reverse video to regular display (see Figure 1).

Needless to say, the two bytes at addresses 17D and 17E are the attribute bytes used by the 1-2-3 program for border display and cell display. 17D is the attribute byte for the cell, and 17E is for the border. Knowing this, we can change the attributes to our liking. For example, I use the 3270 PC color display in the office, so I change the attribute of the cell (byte 17D) to 02 (black background and green foreground) and the border (byte 17E) to 72

(light gray background and green foreground). The result is a very pleasant 1-2-3 screen. I suppose that it also will apply to the user who runs 1-2-3 on a color monitor only.

The listing of available colors can be found in the Technical Reference Manual. It is in the hardware section under "Programming the Color Select Register of the 6845 CRT Controller Chip."

Note that this patch does not work for the old version of 1-2-3 (Version 1.0).

Charles Lin
Toronto, Canada

It is interesting to know how to modify the display attributes in 1-2-3, but this patch may have limited appeal for those with monochrome displays. The procedure switches attributes for the cells and borders, which, while changing the border from reverse video to regular, puts the rest of the screen in reverse video. If only the

byte at 17E (border) is changed so that both have a value of 07, things look great, but the cell pointer is invisible. If you are doing all your work on a color display, it may be desirable to change your screen colors.

Try different values at the ENTER command (e 17d) during the DEBUG procedure, but have a backup of the original TD.DRV file on hand in case you make a mess (see Figure 1, below).

Date Conversion

In Larry Varney's tip on the conversion of date formats in 1-2-3 that appeared in User-to-User (PC, Volume 3 Number 18) he provided the calculation formula to change a date in a MMDDYY format to one in a YYMMDD format. For instance, his calculation will change a date from 123184 to 841231, so that dates can be sorted correctly.

But what about going the other way,

```
A>debug b:td.drv
-d 17d 17e
xxxx:017d 07 70      (Quit if results right of colon don't match)
-e 17d
xxxx:017d 07.70 <spacebar> 70.07
~w
Writing 02E9 bytes
~q
```

Figure 1: Procedure for modifying 1-2-3's TD.DRV driver to change display attributes. Type everything underlined. Assume a DOS disk with DEBUG.COM is in drive A: and the system disk is in drive B:.

SPREADSHEET CLINIC

that is, changing from a YYMMDD format to a MMDDYY format? Often, particularly in a database, you will store the date in the YYMMDD format to be able to sort records correctly but then want to print them in the more normal format of MMDDYY. Varney's formula will not work for this reverse conversion, but the variation of it shown in Figure 2 performs the trick nicely.

This formula is stated in 1-2-3 terminology, but the same logic will apply in any database or spreadsheet environment.

Andrew N. Schwartz
St. Louis, Missouri

Reader response was very favorable to Varney's original tip, and many of you will appreciate the opportunity to complement it with this corollary formula.

Another variation of this conversion formula relating to 1-2-3's date format is contained in the following letter.

```
=INT(B5*100.0001)-INT(B5*100.0001/1000000)*1000000
```

Figure 2: Formula to convert date in YYMMDD format convenient for sorting to MMDDYY format convenient for humans. Cell B5 is the location of the date to be converted.

Original macro:

```
{edit}{home}^{right}{right}/{right}{right}/^{down}
```

Safer version:

```
{edit}{left}{left}/{left}{left}{left}/{home}^{down}
```

Figure 3: Macros to convert dates in numeric format (e.g., 123184) into labels that include slashes for readability (e.g., 12/31/84).

To convert from YYMMDD format:

```
@DATE(INT(B5*0.0001),INT(B5-(INT(B5*0.0001)*10000))*0.01,  
((B5*0.01)-INT(B5*0.01))*100)
```

To convert from MMDDYY format:

```
@DATE(((B5*0.01)-INT(B5*0.01))*100,INT(B5*0.0001),  
INT(B5-(INT(B5*0.0001)*10000))*0.01)
```

Figure 4: Formulas to convert date entries in numeric format (e.g., 123184) into Lotus's date format (e.g., 3/10/87, or 31-Dec-84 in a date-formatted cell).

Macro Dating

I read with interest Paul Somerson's comments on date formats in User-to-User (PC, Volume 3 Number 18). For the user who likes the dates input in YYMMDD format and then converted to and displayed in a YY/MM/DD or MM/DD/YY format, it is a very easy task that requires using a macro. I have a macro that will convert a date in the straight numerical format, 123184, to a label in the format 12/31/84 (see Figure 3).

As a heavy 1-2-3 user, I find that I can enter data much more quickly in a straight numerical mode and then use a macro to convert it to a different format. Another example of this technique is to enter telephone numbers as a formula, say 323-1223, and then use an edit macro to convert the value to a label.

I also have a formula (Figure 4) that will read a date presented in the format 123184 and convert it to the format that 1-2-3 requires for its date manipulations. If

the date is in any different order (say, YYMMDD), it is necessary to swap the values in the @DATE function around.

Timothy K. Bowman
Spokane, Washington

The technique for changing numbers to labels that include punctuation marks can certainly be an aid to readability, but the macro you provided will only be useful for dates in October, November, and December. If May 7, 1984, is entered as 050784, 1-2-3 will drop the leading zero and print 50784. The result after being run through your macro will be 50/78/4. A safer variation (shown in Figure 3) starts at the end of the number entry on the edit line and works its way toward the front, giving the desired 5/07/84.

The formula using the @DATE function (Figure 4) also solves the readability problem as long as cells are formatted properly (/Range Format Date). It has the advantage of being faster and more useful to users who take advantage of Lotus's system of dealing with dates.

With Symphony

Symphony users who are accustomed to using the 1-2-3 utility disk File Manager and Disk Manager programs can use them with Symphony. Simply attach and invoke DOS.APP, insert the 1-2-3 utility disk in the current drive, and type LOTUS.

Jesse Maine
Springfield, Oregon

Symphony users who have upgraded from 1-2-3 may find comfort in this tip, but there are important implications here for any Symphony user. The Lotus Access System and related utility programs can indeed be run while Symphony remains loaded, but, with sufficient memory, any other program (including 1-2-3) or DOS command can be executed as well. Entering EXIT from the DOS prompt returns you to your Symphony worksheet.

"Attaching" the DOS add-in application in Symphony is easy. A file called DOS.APP is supplied on the Symphony

SPREADSHEET CLINIC

and then deleting the 0 and 6 records.

In the example in Figure 5, first use /WGRM to suppress the calculation and format A3 to A26 with the Date 1 format. Enter the first date on A3 using the initial date number or @TODAY. Step the date using 1+A3 in cell A4 and copy this to cell A26 to complete the list.

Column B will be used for a serial number created by the fill command. The initial number will be the number of the weekday (in this example, 2 for Tuesday in cell B3). To calculate the weekday number in column C, divide the serial number by 7 and use the remainder for the weekday number. To do this, enter @MOD (B3,7) in C3 and then copy to the end of the list. Monday through Friday is now numbered 1 to 5.

The formulas in columns A and C must be changed to values, prior to the deletion, with a keyboard macro named \C:

```
{Edit} {Calc} {Down} /XG/C
```

The criterion range at F11 to F13 specifies that day numbers 6 and 0 be deleted from the field named DAY at cell C2. Enter the command /DQIA2.C26 to specify the input range, then enter CF11.F13DD to specify the criterion for the deletion.

Re-use column B for the day names. Add Tue. through Fri. for days 2 through 5 and Mon. for day 1 in cells B3 to B7. Locate the cursor at B8 and copy this down the list using macro \D:

```
/CB3.B7~ {Down} {Down}  
{Down} {Down} {Down} /XG/D
```

Figure 6 shows the date list.

Robert L. Novak
Chesapeake, Virginia

Users interested in the stock market will appreciate the ability to dispense with Saturday and Sunday. Others may want to eliminate the /Data Query part of the procedure and add two extra {Down}'s to the \D macro, allowing the weekends to remain.

Remember that \C and \D are macros

with endless loops and will march down to the basement of the worksheet unless stopped with Ctrl-Break. For short columns, delete the /xg commands at the ends of these macros and invoke Alt-C or Alt-D one at a time. Also, see Figure 7.

Tell the world about your latest spread-

sheet discovery through PC's Spreadsheet Clinic, and we'll pay you \$50, plus an extra \$25 if you submit it on a disk.

If you send a disk, please include a printout of your submission. Mail your contributions to: Spreadsheet Clinic, PC Magazine, One Park Avenue, New York, NY 10016.

A2:										READY
1	A	B	C	D	E	F	G	H	I	J
2	WEEKDAY		DAY							
3	04-Sep-84	2	2	\C	{edit}{celc}{down}/xg/C					
4	05-Sep-84	3	3							
5	06-Sep-84	4	4							
6	07-Sep-84	5	5							
7	08-Sep-84	6	6							
8	09-Sep-84	7	0							
9	10-Sep-84	8	1							
10	11-Sep-84	9	2							
11	12-Sep-84	10	3			DAY				
12	13-Sep-84	11	4			6				
13	14-Sep-84	12	5			0				
14	15-Sep-84	13	6							
15	16-Sep-84	14	0							
16	17-Sep-84	15	1							
17	18-Sep-84	16	2							
18	19-Sep-84	17	3							
19	20-Sep-84	18	4							
20	21-Sep-84	19	5							
										CALC

Figure 5: A continuous range of dates in column A is assigned serial numbers using /Data Fill in column B. The @MOD function is used in the formula in column C so that each date is associated with a value from 0 to 6, representing Sunday through Saturday.

A2:										READY
1	A	B	C	D	E	F	G	H	I	J
2	WEEKDAY		DAY							
3	04-Sep-84	Tue.	2	\C	{edit}{celc}{down}/xg/C					
4	05-Sep-84	Med.	3							
5	06-Sep-84	Thu.	4							
6	07-Sep-84	Fri.	5							
7	10-Sep-84	Mon.	1	\D	/CB3.B7~{down}{down}					
8	11-Sep-84	Tue.	2		{down}{down}{down}/xg/D					
9	12-Sep-84	Wed.	3							
10	13-Sep-84	Thu.	4							
11	14-Sep-84	Fri.	5							
12	17-Sep-84	Mon.	1			DAY				
13	18-Sep-84	Tue.	2			6				
14	19-Sep-84	Wed.	3			0				
15	20-Sep-84	Thu.	4							
16	21-Sep-84	Fri.	5							
17	24-Sep-84	Mon.	1							
18	25-Sep-84	Tue.	2							
19	26-Sep-84	Wed.	3							
20	27-Sep-84	Thu.	4							
										CALC

Figure 6: Entries with a 0 or 6 in column C have been eliminated. The macro \D takes the five day-name labels that were entered once and copies them down the column.

```
@IP(+C3=1,"Mon",@IP(+C3=2,"Tues",@IP(+C3=3,"Wed",@IP(+C3=4,"Thu",@IP(+C3=5,"Fri",@ERR))))
```

Figure 7: Symphony formula to assign weekday names based on numerals 1 through 5 found in cell C3. An error message (@ERR) appears if any other value is present.

101 Hands-on Micro Software Evaluations. Yours for just \$19 each!

The only way to really see what a software package can do is to try it out. But software evaluations take time—and money. And even then you can't be sure you didn't overlook something big.

That's why thousands of corporate micro software buyers are turning to Data Decisions for accurate, up-to-the-minute information and independent hands-on analysis.

Data Decisions gives you the results of tests done under *consistent, controlled conditions* by a specially trained team of micro experts who

tell you what each product's strengths and limitations are and how suitable it is for corporate use. They also give you all the pricing and specs.

“Just one report saved me three nights of tinkering at a computer store on my own time. It's like having a consultant sitting right there at the end of the desk.”

—Bob Butler, Mechanical Engineer
Gillette Company, Boston, MA

Until recently these evaluations

were available only to subscribers to MICROCOMPUTERS, Data Decisions' 3-volume monthly updated information service. Now you can receive some of the same reports our subscribers get for only \$19 each, just by filling out and returning the order form below. If you include payment with your order, you'll avoid a shipping charge.

Data Decisions

20 Brace Road • Cherry Hill
New Jersey 08034 • (609) 429-7100
CIRCLE 140 ON READER SERVICE CARD

Data Decisions 20 Brace Road Cherry Hill, New Jersey 08034 • (609) 429-7100

Spreadsheets, Finance and Planning

- Business Planning Tool
- CaleIT
- CaleStar
- Intecale
- Multiplan
- Peacale
- Perfect Calc
- SuperCalc-3
- TKISolver
- VisiKale
- Visi On Calc
- VisiSchedule

Data Management

- Advanced DB Master
- Benelmark
- Data Manager
- Btrieve
- C.L.P.
- Dataease
- DataStar
- Day One DBMS
- dBASE III
- dBASE III
- DHM II—The Integrator
- Domus
- Correspondence Control Manager
- Fast Facts
- Friday!
- Instant Recall
- KeepIT

Knowledge Manager

- Metafile
- Nurdell
- Omenfile
- Perfect Filer
- Personal Pearl
- pfsFile
- pfsReport
- PowerBase
- ProBase
- R:Base Series 4000
- ReportStar
- Revelation
- T.I.M. IV
- Under Control
- Versaform XL
- VisiFile

Word Processing

- Benchmark
- Easy Writer II
- Finalword
- Megawriter
- Multimate
- New Word
- Office Writer
- Palantir Word Processor
- Peachtext
- Perfect Writer
- pfsWrite
- Select
- Spellhandler
- Superwriter
- Textra

VisiWord

- Volkswriter Deluxe
- Word
- Samna Word II
- Wordperfect
- WordStar
- Graphics
- HPS Business Graphics
- Chart Master
- IGRAPH
- Fast Graph
- Graphics Department
- Grafalk
- PC-Draw
- Peachtree Business Graphics System

pfs:Graph

- Visi On Graph

Communications

- BLAST
- Crosstalk
- Data Capture
- IHM Asynchronous Communications Support
- PC/Intercomm
- PC-TALK III
- Perfect Link
- Smartcom II
- The APPLE-IHM Connection
- VisiLink

Integrated Packages

- AURA
- Context MBA
- ENCORE!
- Framework
- Goldengate
- Lotus 1-2-3
- PC/Focus
- SeriesOnePlus
- Symphony
- III E-Z Pieces

Utilities

- Colortext
- DESQ
- Norton Utilities
- Oneshot
- Prokey
- Quickcode

Total Quantity Ordered.....
Total Cost for Reports (\$19 ea.)..... \$
\$2 Shipping/Handling per Report..... \$
Total (Sales tax will be added on invoice where applicable)..... \$
Signature _____
Name _____ Title _____
Company _____ Telephone _____ (area code)
Address _____
City _____ State _____ Zip _____

ABSOLUTELY FREE

**MAXELL MD-2 DISKETTES AND PRINTER CABLE
WITH PURCHASE OF SYSTEM SPECIALS (A \$69.95 Value)**

System #1A

IBM PC 256K

IBM PC 256 K
2 - 360K Drives
IBM Mono Interface
Printer Interface
PGS Max-12 Monitor

\$2035⁰⁰

System #2A

COLOR PACKAGE

IBM PC 256K
2 - 360K Drives
Hercules Color Card
Printer Port
PGS-Color-HX-12

\$2455⁰⁰

System #3A

IBM PC-XT

IBM PC 256K
10 MB Fixed Disk
1 - 360K Drive

\$2409⁰⁰

System #4A

IBM PC-XT 256K

10 MB Internal Hard Drive
1.2 MB Floppy Disk Drive
360K DS/DD Disk Drive

\$2859⁰⁰

System #5A

FULL WORDS PROCESSING

IBM PC 256 K
2 - 360K Drives
IBM Mono Interface
IBM Mono Display
DOS 2.1 • Juki 6100
Multimate WP

\$2955⁰⁰

System #7A

640K IBM PC

IBM PC 256 K
2 - 360K Drives
AST 384K - 6 Pac Plus
IBM Mono Interface
IBM Mono Display

\$2655⁰⁰

IBM is a registered trademark of the International Business Machines Corp.



(212) 420-8363

**C.O.D. Orders Accepted!
Take Advantage of
Our Years of Experience!**

System #6A

IBM PC XT 20 MEG

IBM 256K
20 MB Internal Hard Drive
1.2 High Capacity Drive
360K DS/DD Drive
140W Internal
Power Supply

\$3359⁰⁰

System #8A

COMPAQ® w/10MB Hard Drive

256K • DOS
1 DS/DD Disk Drive

\$3035⁰⁰

• COMPUTERS •

AT & T 6300	2375.
AT & T w/10 MEG	4000.
IBM XT 256K	3375.
IBM XT 512K	3595.
IBM 256K - 1 Drive	1619.
IBM 256K - 2 Drive	1750.
Compaq Dual Drive 256K	2099.

• PRINTERS •

RX-80	239.
RX-80 FT PLUS	299.
FX-80 PLUS	395.
FX-100 PLUS	599.
JX-80	575.
LQ 1500	1075.
Okidata 2410	CALL
Okidata 92-P	375.
Okidata 93-P	595.

Okidata ML 84	685.
Toshiba 1351	1249.
Toshiba 1340	695.
Tractor 1351	149.
Juki 6100	409.
Juki 6300	CALL
NEC 3550	1349.
HP Laser Jet	2775.

• MONITORS •

Amdek 300A	152.
Amdek 300G	135.
Amdek 310A	165.
Amdek Newest Models	CALL
Princeton HX-12	467.
Princeton MAX-12	178.
IBM Color	560.

• MODEMS •

Hayes 1200B w/Smart Com II	395.
----------------------------	------

Hayes 1200	449.
Hayes 300	199.

• FIXED DRIVES •

Tall Grass 3020	2375.
Micro Science 10 MB	725.
TG 3135 35MB w/45MB Tape	3999.
TG 3012 10MB w/Cartridge	1859.

• DISK DRIVES •

Teac 1/2 Height	149.
CDC - DD/DS	149.
IBM - DS/DD	239.

• INTERFACE CARDS •

IBM Color Graphics	195.
Hercules Graphics Card	309.
Hercules Color Card	165.
AST-384K-6 Pac Plus	480.

• CHIPS •

64K Chip Sets	35.
---------------	-----

• SOFTWARE •

Lotus 1-2-3	298.
Lotus Symphony	426.
Ashton Tally DBase III or Framework	350.
Wordstar Professional Pack	249.
Multimate	235.
Word Perfect	248.
Innovative Smart Software	590.
KnowledgeMan 1.7	259.
Insearch	269.
Supercalc 3 Release 2	198.
Alpha Data Base Manager II 2.0	160.
Crosstalk XVI	99.
PFS File	84.50
PFS Graph	84.50
PFS Report	84.50

Testing the Testmakers

None of the testmaking programs on the market is great; in fact, some could use remedial programming. Their menus and manuals are especially deficient for novices and pros alike.

How do professors prepare their tests? For frequently offered courses with high enrollments, questions are often selected from a printed test bank supplied by the textbook publisher. The professor marks the selected questions, changes some, adds others not originally found in the bank, supplies headings and instructions, and turns the material over to a typist. Sometimes a second version with the same questions in different order is typed to foil cheating.

As personal computers have become more common on campus, publishers have begun to supply questions and software for test creation on floppy disks. The advantages to professor and school are the savings in typing, proofreading,



and lead time required for test creation. The advantage to the publisher, of course, is the competitive advantage the testing package gives to the textbook.

Current Offerings

Most testing packages allow you to scroll through or skip around in the bank of questions and bring each to the screen. You can then select particular questions for inclusion in the test. Some packages allow you to designate a number of questions to be selected at random from the chapter bank. The chosen questions are printed with the appropriate heading and instructions. A separate answer key is printed along with the page numbers of

the corresponding text. Multiple copies and multiple scrambled versions of the test can also be printed. New questions can be added and existing questions modified or deleted.

In testmaking software on the market now, menus several layers deep carry you every step of the way. Except when entering new questions, you type a number to indicate your menu choice.

Unfortunately, software tasks are complicated rather than facilitated by menus that aren't divided logically and organized in a way that makes some sense. Current testmaking software does not meet these requirements. The menus slow you down, as does verification, a constant theme of the packages and one that makes them frustrating to use.

The manuals tend to be dreadful. They try to teach a subset of DOS and do so poorly, when they might do better by referring you to the DOS user's guide or one of the many books on the subject. Users with personal computer experience will find the manuals patronizing; novices will find them confusing.

MICROPAC and *Test Management System* are broadly representative of the half dozen or so packages currently available for the IBM PC. These programs, like most testing software, are supplied free upon request to adopters of the appropriate texts.

(continued)



MICROPAC

Microsystems Software Ltd
2131 E. Broadway, #19
Tempe, AZ 85282
(602) 966-8615

Available with selected texts of:
Wadsworth Publishing
10 Davis Drive
Belmont, CA 94002

Requires: 64K RAM, two disk drives, printer.

CIRCLE 650 ON READER SERVICE CARD

Unappetizing Menus

MICROPAC supports five types of questions: multiple choice, matching, true-false, fill-in-the-blank, and essay. It allows you to select questions or pull them at random from each chapter. You can alter the question bank by adding, deleting, or modifying questions.

MICROPAC is highly menu oriented. Unfortunately, the menu structure is poorly designed and confusing. The main menu gives access to three secondary menus: Test, Bank, and Make. The Test menu allows you to print a chapter's entire set of questions, designated questions, or randomly selected questions. A submenu determines whether these will go to the printer or to disk. However, the Bank and Make menus duplicate functions that appear on the Test menu. They also occasionally duplicate each other. While some menu-driven programs of other types—such as Lotus's 1-2-3—have similar duplications, their repetitiveness is for a purpose. Here, it doesn't make things easier. In fact, it makes learning difficult because the manual doesn't warn about the repetitions and it takes a while to realize that, at heart, **MICROPAC** has just a few basic functions.

The manual is as tangled as the program and omits much information that would be useful. It doesn't bother to mention, for instance, that the program requires DOS 1.x. To run the program, you must install **BASICA** on the system

disk. When I tried it using DOS 2.1, **BASICA** wouldn't fit. Neither manual nor screen gave any clue what to do next. Copying the system disk to a disk formatted with DOS 2.1 allowed the installation

MICROPAC is a highly menu-oriented package. Unfortunately, the menu structure is poorly designed and confusing.

process to proceed. In addition, the screens are all 40 columns wide, and the manual gives no hint about how to change to 80.

A Serious Bug

The program itself has a serious bug. Selecting the Bank and then the Edit menu takes you to the screen where the questions are edited. Here you have seven choices, one of which is intended to take you back out to the Bank menu and, if you wish, to the main menu. If you do select this option, however, you will receive a message insisting that there is an invalid Bank name and demanding a system disk, even when one is inserted. A system restart is needed, which may result in a loss of work.

Average Grades

Test Management System comes on a distribution disk from which you prepare three system disks. Also included are about four disks of test questions, which may be true-false, fill-in, or multiple-choice. The main program, called Exam, allows you to select questions from each chapter and print a test with a separate answer key and a second version in reverse order. While you can select all the questions in a chapter or designate partic-

ular ones, you can not select a designated number at random, although a randomizing feature does appear elsewhere.

You can call each question to the screen for review as you designate it before finally deciding whether to include it, although you can also read it on the printed version. However, since questions are read from disk one at a time, the process is painfully slow.

An Interactive Quiz Feature

Test Management System's interactive quiz feature is its best. It involves two programs, Select and Quiz. The Select program allows you to mark questions on the question disks. You can pick the questions, or you can have the program select a designated number at random. Once Select has done its job, you can give the student the Quiz program disk and the question disk to take an interactive test that provides immediate feedback on each question.

Two more programs, Entry and Edit, allow you to edit or delete existing questions and add new questions. These programs are adequate for minor revisions but are awkward for major jobs, such as entering a lot of new questions. Despite this limitation, if you are willing to enter a whole new set of questions once at the keyboard, there is no technical reason why you could not use **Test Management** with any text.

MICROPAC and **Test Management System** are typical testing programs; they have a few features that are helpful and a great many more that will interfere with test preparation. Later versions with the bugs removed and with improved organizations will be more useful; meanwhile, I prefer to use a general-purpose file-handling program or an integrated package to manage my test preparation. ■

Jordan Rosenberg is a consultant to users of professional and business micro-computer systems and a faculty member at The California State University, Hayward.



Test Management System

Wilson T. Price & Stephen Brown
Available with selected texts of:
Holt, Rinehart, & Winston
Division of College Marketing
383 Madison Ave
New York, NY 10017
(212) 872-2021

Requires: 128K RAM, two disk drives, printer.

CIRCLE 651 ON READER SERVICE CARD

Putting the PC Before the Cart

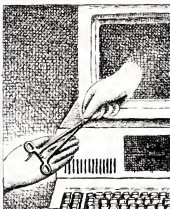
The critical nature of surgery requires that everything be accounted for when needed. Any efficient case cart system can ensure that the right scalpel is in the right place.

While a member of a medical brigade in Honduras, I saw my first surgical procedure. Surgery was a real challenge there with primitive, sometimes improvised equipment. On many occasions, retractors were fashioned from forks. Once a rock, carefully selected from the parking lot, diligently scrubbed and sterilized, served as an orthopedic hammer.

When I began working at Duke Medical Center where conditions are, of course, much better, I was introduced to the case cart system for supply of surgical tools. Its basic function is to ensure that the right instrument is available for the right procedure. Compared to the methods of preparing for surgery I had seen in Honduras, even the manual case cart system used then was a dramatic improvement. But in comparison to the computerized system now in use at Duke, which is written in *dBASE II* and run on a PC-XT, that manual system seems as primitive as the techniques I saw used in Honduras.

Cart Filling

An efficient case cart system provides an up-to-date list of the instruments and supplies required for a particular surgical procedure. This list, called the case cart requisition, is used to fill the cart itself with the necessary instruments and sup-



plies. The cart is then sterilized and taken to the operating room. Accurate charging for case carts, collecting usage information for instruments and surgical procedures, and providing management information are all additional important functions of a case cart system.

The amount of surgery performed at Duke demands an efficient case cart system. The hospital performs more than 650 different procedures, each of which may require up to 60 different items and the caseload runs 60 to 100 cases daily.

The Old Way

Under the old manual system, the operating room staff at Duke, run by the

Department of Sterile Processing, typed case cart requisitions for a given procedure to be kept on hand. When a particular procedure was scheduled, the requisition was pulled, the cart was filled, and the completed cart was sent to the O.R.

Many similar procedures were grouped together for simplicity, and although the system met the needs of the operating room staff well, it had the disadvantage of being cumbersome because many procedures had to be done manually.

To change a case cart requisition under that system, the master was edited, and then manually revised, a task that kept one person occupied for a while. Another tedious procedure was keeping up with the current prices and charging the requisitions accordingly. Gathering usage data for maintaining correct inventory levels, budgeting, and for competitive bidding was also a time-consuming chore. Usage information was kept in 12 notebooks, with one page allotted to each item. Then, each time an item was ordered, the date, quantity, and price had to be written on the correct page in one of the 12 books.

Database Needed

Some hospitals had developed systems using word processors, and under these, each requisition was stored as a separate file and was updated and printed when nec-

SHELF CONSCIOUS?

Now you can organize your copies of

PC MAGAZINE

Now your magazines can be a handsome addition to your decor, well organized, and easy to find, thanks to these durable library-quality cases or binders. They're made of luxury-look leatherette over high-quality binder board. And both styles are custom-designed for this or any other magazine you save, with size, color and imprint selected by the publisher. FREE transfer foil included for marking dates and volumes.



Magazine binders

holds your issues on individual snap-in rods, combining them into one volume. \$7.95 each, 3 for \$22.50, 6 for \$42.95. Mixed titles OK for quantity prices.



Open-back cases

store your issues for individual reference. \$6.95 each, 3 for \$19.75; 6 for \$37.50. Mixed titles OK for quantity prices.



For faster service,
CALL TOLL-FREE
800-526-0790
(In NJ only 201-540-0445)

PC Magazine

P.O. Box 5120, Philadelphia, PA 19141

Please send ☐ Cases ☐ Binders

TITLE _____ QUANTITY _____

PC Magazine

Other _____

☐ PAYMENT ENCLOSED \$ _____ * Add \$1.00 per order for postage and handling. Outside USA add \$2.50 per unit ordered; send US funds only.

☐ CHARGE (Minimum \$10+)

☐ American Express ☐ MasterCard
☐ Visa

Card No. _____ Exp. Date _____

Signature _____

Print Name _____

Address _____

City _____

State/Zip _____

*Residents of PA add 6% sales tax

MEDICINE

essary. At Duke, we knew, though, that with our requirements for charging, editing, and gathering usage data, the system would have to use a relational database. In addition, the system would have to handle price changes easily, gather usage data, and perform efficiently.

Because the easiest way to handle price changes is to store only the price at one place in the database, I created an item file that contained simply a stock number, a description of the item, and the price.

An efficient database structure has little data redundancy. With that in mind, I avoided redundancy by dividing the database into separate ones. This way, I conserved space on the hard disk, saved clerical time, and, at the same time, increased the database's reliability and accuracy.

Aside from the item file, the two other main databases are the procedure and the case cart files. The procedure file contains the case cart identification number, the procedure name, the service, and

more than 650 records, one for each surgical procedure. To create the file, you assign stock numbers to a case cart procedure, which contains the case cart ID,

At Duke we knew
our system would
have to use a
relational
database

the stock number, and the quantity of the item. Each record in this procedural database, which now has 20,000 records, represents one line item on a case cart requisition.

For each case cart requisition, records from the item file are matched with a corresponding surgical procedure as shown in Figure 1. Quantities are indicated, and the requisition can then be printed out. Requisitions are stored in the case cart database and can be edited easily when

(A) Item File

1524 SPONGES, LAPAROTOMY ST. (NICKS)
L132 SMALL TOWEL IV
L154 GOWNS I
L198 MINOR PACK
0418 HEMO CLIP
0496 LAWRENCE CLAMP
R138 BASINS (2) SETS
R226 GENERAL SET
... continues

(B) Surgical Procedure File

C194 AMPUTATIONS
C203 BOWEL CASE
C209 CHOLECYSTECTOMY
C227 GASTRECTOMY
C237 HICKMAN CATHETER INSERTION
C239 INGUINAL HERNIA
C251 NODE BIOPSY
... continues

(C) Case Cart File (Requisition)

Case Cart ID: 203
Procedure: BOWEL CASE
Service: GENERAL

QTY ITEM DESCRIPTION

1	L198	MINOR PACK
2	L154	GOWNS I
4	L132	SMALL TOWEL IV
1	R226	GENERAL SET
2	0418	HEMO CLIP
4	0496	LAWRENCE CLAMP
1	R138	BASINS (2) SETS
4	1524	SPONGES, LAPAROTOMY ST. (NICKS)

Figure 1: A sample case cart requisition, which matches items with a surgical procedure.

Now, the lowest prices ever on **3M Scotch® DISKETTES**

\$153^{ea} 5 1/4" SSDD QTY 20
\$206^{ea} 5 1/4" DSDD QTY 20

5 1/4" SSDD 96TR — \$2.29 ea. 5 1/4" DSDD 96TR — \$2.85 ea.
SOFT SECTOR ONLY! MINIMUM ORDER: 20 DISKETTES
These are factory-fresh 3M diskettes packed in boxes of 10 with Tyvek sleeves, reinforced hubs, identification labels and write-protect tabs.

5 1/4" MICRO DISKETTES—\$5.135 TP — \$2.89 ea.
LIFETIME WARRANTY ON ALL 3M SCOTCH DISKETTES!
FOR ORDERS ONLY: INFORMATION & INQUIRIES:
1-800-621-6827 1-312-944-2788
(In Illinois: 1-312-944-2788)

HOURS: 8AM-5PM Central Time, Monday-Friday
WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Distributor Information Processing Products **3M**

FANTASTIC LOW PRICES ON **BASF** QUALIMETRIC DISKETTES!

\$141^{ea} 5 1/4" SSDD QTY 20
\$159^{ea} 5 1/4" DSDD QTY 20

PACKED IN PLASTIC LIBRARY CASES
BASF QUALIMETRIC DISKETTES have a LIFETIME WARRANTY and are packed in PLASTIC LIBRARY CASES with Tyvek sleeves, reinforced hubs, user identification labels and write-protect tabs.

SOFT SECTOR ONLY! MINIMUM ORDER: 20 DISKETTES
BASF 3 1/2" MICRO FLOPPIES 5 1/4" SSDD 96TR — \$3.02 ea.
FOR ORDERS ONLY: INFORMATION & INQUIRIES:
1-800-621-6827 1-312-944-2788
(In Illinois: 1-312-944-2788)

HOURS: 8AM-5PM Central Time, Monday-Friday
WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Reseller Information Processing Products **BASF**

Incredible value! **Nashua™ Diskettes**

LIFETIME WARRANTY!
\$105^{ea} 5 1/4" SSDD QTY 50
\$115^{ea} 5 1/4" DSDD QTY 50

These are poly-bagged diskettes packaged with Tyvek sleeves, reinforced hubs, user identification labels and write-protect tabs. NASHUA Corporation is a half-billion dollar corporation and a recognized leader in magnetic media.

SOFT SECTOR ONLY! Sold in multiples of 50 only!
FOR ORDERS ONLY: INFORMATION & INQUIRIES:
1-800-621-6827 1-312-944-2788
(In Illinois: 1-312-944-2788)

HOURS: 8AM-5PM Central Time, Monday-Friday
WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Distributor Information Processing Products **NASHUA**

Save 20% to 60% Or More

On all your
OFFICE & COMPUTER SUPPLIES!

Now, you can enjoy DISK WORLD! savings on more than 21,000 office and computer supply products! You name it, we got it, at tremendous savings.

Everything from Scotch® Tapes to Post-it® Notes™ to paper clips and rubber bands, and thousands of computer products as well.

Our catalog is huge—more than 700 pages. Listing more than 21,000 items.

We have to charge for it: \$10.00 to be exact.
But we include a \$50.00 worth of discount coupons that you can use on future orders.

Now it's DISK WORLD! for every office or computer supply need—and always at tremendous savings!

The offer supercedes all prior catalog offers.
Not responsible for typographical errors.

FOR ORDERS ONLY: INFORMATION & INQUIRIES:
1-800-621-6827 1-312-944-2788
(In Illinois: 1-312-944-2788)
HOURS: 8AM-5PM Central Time, Monday-Friday
WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD!

DISK WORLD! Ordering & Shipping Instructions

Shipping: 5 1/4" & 3 1/2" Diskettes—Add \$3.00 per each 100 or lower diskettes. **Other Items:** Add shipping charges as shown in addition to other shipping charges. **Payment:** VISA and MASTERCARD accepted. **COO Orders:** Add additional \$3.00 Special Handling Charge. **APR, FPO, AK, HI & PR Orders:** Include shipping charges as shown and additional 2% of total order amount to cover PAL and insurance. **Taxes:** "No" residents only add 8% sales tax.

Prices subject to change without notice.
This ad supersedes all other ads.
Not responsible for typographical errors.
MINIMUM TOTAL ORDER: \$35.00

FOR ORDERS ONLY: INFORMATION & INQUIRIES:
1-800-621-6827 1-312-944-2788
(In Illinois: 1-312-944-2788)
HOURS: 8AM-5PM Central Time, Monday-Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD!

ATHANA DISKETTES The great unknown!

99¢^{ea} 5 1/4" SSDD QTY 50
\$109^{ea} 5 1/4" DSDD QTY 50

You've used these diskettes hundreds of times—as copy-protected originals on some of the most popular software packages. They're packed in poly-bags of 25 with Tyvek sleeves, reinforced hubs, user identification labels and write-protect tabs.

LIFETIME WARRANTY!
SOFT SECTOR ONLY! Sold in multiples of 50 only.

FOR ORDERS ONLY: INFORMATION & INQUIRIES:
1-800-621-6827 1-312-944-2788
(In Illinois: 1-312-944-2788)
HOURS: 8AM-5PM Central Time, Monday-Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Distributor Information Processing Products **ATHANA**

DISKETTE STORAGE CASES

AMARAY MEDIA-MATE 50: A REVOLUTION IN DISKETTE STORAGE

Every once in a while, someone takes the time, and makes it elegant. This set nests 50 5 1/4" diskettes has grooves for easy stacking, inside hinges to keep diskettes from slipping and several other features. We like it!

\$10.95 — \$2.00
\$11.95 — \$2.00
DISK CADDIES — \$1.95
The original thin holder for 10 5 1/4" diskettes. Bigger or grey only.

FOR ORDERS ONLY: INFORMATION & INQUIRIES:
1-800-621-6827 1-312-944-2788
(In Illinois: 1-312-944-2788)

HOURS: 8AM-5PM Central Time, Monday-Friday
WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD!

PRINTER RIBBONS:

at
**extraordinary
prices!**

Brand name ribbons, manufactured to Original Equipment Manufacturer's specifications, in housings. (Not ink-jet or specialty only.)

LIFETIME WARRANTY!
EPSON MX-70/80 . . . \$3.58 ea. + 25¢ Shpg.
EPSON MX-100 . . . \$4.95 ea. + 25¢ Shpg.
Okidata Micro83 . . . \$1.48 ea. + 25¢ Shpg.
Okidata Micro84 . . . \$3.56 ea. + 25¢ Shpg.

FOR ORDERS ONLY: INFORMATION & INQUIRIES:
1-800-621-6827 1-312-944-2788
(In Illinois: 1-312-944-2788)
HOURS: 8AM-5PM Central Time, Monday-Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD!

PAPER: Save 50% or more!

We buy paper by the TRUCKLOAD from the two biggest mills in the country.

Therefore, we charge a lot less than you've been paying!

For the complete DISK WORLD paper catalogs and price lists, call 1-312-944-2788 or write us. (Please do not use the "800" line for paper catalog requests, unless you are also placing an order.)

Don't spend more than you have to for top-quality computer printer paper. Call DISK WORLD today.

INFORMATION & INQUIRIES:
1-312-944-2788
HOURS: 8AM-5PM Central Time, Monday-Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Where paper Costs less!

any changes are necessary.

In order to find out which carts contain items not being used, I added usage fields. The usage fields in the procedure

file describe monthly and yearly usage for each procedure; the usage fields in the case cart file describe usage data for each item on a case cart. In addition, this data

is consolidated to give the total usage of each item.

With *dBASE II* I created a menu-driven program that maintains the database relationships. Another advantage, and one that should not be underestimated, is that operators need very little training before they can maintain, print, and charge case cart requisitions.

GIVE YOUR PC THE GIFT OF SIGHT.



Once installed, our electronic digitizing scanner allows you to capture images in high resolution. These can then be manipulated, stored, retrieved, and even printed.

But what's truly amazing is the range of applications for the Datacopy 700. Such as generating complex documents including text, drawings and pictures.

Until now, your PC was telling only half the story. Because no matter how you look at it, words and numbers are simply that: words and numbers.

But the Datacopy 700 changes all that. **TURN YOUR WORD PROCESSOR INTO AN IMAGE PROCESSOR.**

This remarkable peripheral enables you to combine photos, diagrams, even 3-D objects with word processing, data base, CAD and communications applications using standard software.

All you need to get the picture is an IBM XT, AT, or compatible. Our friendly, yet powerful, Word Image Processing System™ software is included in your purchase.

Technical manuals. Catalogs. Personnel or document files. Or what ever you decide.

The result is a visionary achievement: the power to give words and numbers far more meaning. To publish information, not just data. And to extend the possibilities of your PC. All for a surprisingly low cost.

For more details, call toll-free 1-800-821-2898 or in California 415-965-7900. Or write to Datacopy Corporation, 1215

Terra Bella Avenue,
Mountain View,
CA 94043. Telex:
701994 DATA-
COPY UD.



DATACOPY
The Eye of the Computer

The case cart database provides the usage history of each item in a surgical procedure.

A Good Year

After working with the system for nearly a year, the Central Service has realized many benefits, including the reduction of costs. Now, copying costs, waste due to outdated requisitions, and the clerical time that is needed to manually change requisitions have all been eliminated.

In addition, the case cart database provides information never before possible. As an example, operating room personnel can see the usage history of each item in a surgical procedure and acquire the information needed to build the case cart correctly. Items that are not being used can be identified and removed from the case carts. Usage histories for each surgical procedure also are available. The system gives information on which procedures have the highest volume and when those procedures are used. That's important because the use of every item is invaluable for budgeting and competitive bidding processes.

Other functions of a hospital Central Service department lend themselves to computerization, including a perpetual inventory of supplies, operating room utilization, and scheduling in the operating room. Duke's case cart database is just the first step.

Computer Education: Legal Aid

Professional groups for attorneys as well as courseware in law schools help educate attorneys about computer capabilities, putting them at ease with sophisticated technology.

Although lawyers weren't early participants in the computer craze, their current interest in computer applications and their increasing numbers as PC users do them justice. Most significantly, many of the more than 40,000 law students who are graduated each year have become comfortable with computers while in school, and they bring this experience to their practices.

But many potential micro users don't have this background and need institutions whose continuing education programs can assist them, like the American Bar Association, the Center for Computer-Assisted Legal Instruction, and the IIT Center for Law and Computers. The statistics tell the story.

About 80 percent of the lawyers in the United States are in private practice, with more than 60 percent belonging to firms that have from one to three professionals. Attorneys in these small firms have eagerly welcomed the micro's abilities: For an investment of less than \$10,000, at-



torneys can have a machine that handles an investment of multiple applications—that is, once they learn how to put their sophisticated new computers to use.

The PC as Paralegal

The PC helps attorneys in several ways. For example, in word processing and document assembly, a PC equipped with a word processor offers an undeniable speed advantage over a typewriter. It's easy to change the format of a standard form or to add a new paragraph to a contract.

For the crucial but time-consuming tasks of time billing and management reports, generic and easy-to-use programs

specifically geared for the law office are emerging. Indexing systems for computerized litigation support deal with the tons of depositions, official records, and other documents that attorneys use for cases or clients.

Computerized Dockets

Most lawyers use some sort of appointment book to keep track of meetings with clients, court dates, and relevant statutes of limitations for particular cases. A computerized docket system helps organize priorities and then prints out a chart to help the attorney navigate a sea of deadlines.

LEXIS, WESTLAW, and the more gen-



American Bar Association
Computer Division, Economic Section
3900 Broadway
Great Bend, KS 67350
(312) 665-4441

CIRCLE 647 ON READER SERVICE CARD

INTRODUCING THE INDEPENDENT GUIDE TO PRODUCTS, SERVICES, PERIPHERALS AND SUPPORT ITEMS FOR YOUR IBM PC OR XT



With literally thousands of different products on the market that are compatible with your IBM PC or XT, how do you find the ones you need? How do you decide which ones are best for you?

With PC Buyers Guide—over 500 pages of listings for IBM-compatible hardware, software and services—from the publishers of PC Magazine.

Every product is fully and accurately described. You'll know what it is, what it does, how much it costs, and what level of skill is required—novice, intermediate or technical.

And in addition to PC hardware and software, you'll get details on all the important extras such as accessories, furniture, books, and consultants.

To order your copy of PC Buyers Guide, simply fill in the coupon below and mail it today.

Mail to:
PC BUYERS GUIDE
CN 1914, Morristown, NJ 07960

Please send me _____ copy(ies) of
PC Buyers Guide. I enclose \$7.95* for each
copy, plus \$1.50 for postage and handling.
Outside the U.S.A., the price is \$10.00, send U.S.
funds only. *Residents of CA, CO, CT, DC, FL, IL,
MA, MI, MD, NJ, NY State and VT add applicable
sales tax.

Name _____
(please print)

Address _____

City _____

State _____ Zip _____

FF7C

LAW

eral Dialog databases offer attorneys and paralegals instantaneous access by modem to research information at reasonable cost. And retrieval of information stored digital-

Emerging educational legal software allows an aspiring attorney a chance to practice legal reasoning and analysis.

ly on videodisk players connected to PCs may be the next logical phase in using technology for legal research.

Electronic mail is a godsend for lawyers, who are often away from their desks. A mailbox in an electronic network can store messages and then forward them on request.

Partners and staff can use magnetic records of earlier work for legal research. Recorded arguments and previous studies can also be adapted by counsel to current cases and clients.

Computer Education for Lawyers

Both law school and continuing education programs for practicing attorneys can confer the benefits of computers. The emerging generation of educational legal software allows an aspiring attorney a chance to practice an advanced form of legal reasoning and logical analysis. And tutorials help attorneys keep up to date with the available technology and with matters specific to their interests.

Much of the computer learning currently going on occurs informally under the auspices of professional groups. The Computer Division of the American Bar Association's Economic Section, a fast-growing interest group of 2,000 members, may double in size by the time the ABA holds its national convention in

Washington, D.C., in July, predicts its chairman, Betsy Turner.

For an additional \$17.50 annual fee, computerized users can participate in 12 different groups, some of which offer newsletters and public-domain software for the legal profession.

In addition, the association will evaluate hardware and software systems, starting with time accounting/billing systems, which are the programs acknowledged to be needed the most by lawyers. Led by Dick Robbins, a lawyer who also is an electrical engineer, the group will evaluate the work of vendors, announce approved systems in the ABA journal, and offer detailed software reviews for a nominal fee. Testing a piece of software using ANSI, IEEE, and AICPA standards will take about three weeks, Robbins estimates.

Law Courseware

The Center for Computer-Assisted Legal Instruction (CCALI) was established in 1982 by Dr. Russell Burris, a professor of law and psychology at the University of Minnesota, and Professor Donald Trautman of Harvard Law School. About 50 member law schools in the United States and Canada pay \$2,000 a year to use the Center's courseware, a series of programs that supplement classroom instruction.

The Center's CAI programs help build students' reasoning and analysis skills in the areas of civil procedure, professional responsibility, evidence, torts, trial advocacy, insurance law, and commercial transactions. Software in each of these specialties can be leased individually for \$150 a year.

Created to run on a wide variety of machines without modification (including Wangs, Hewlett-Packards, and Xerox 820s), the CAI programs are written in a modified Pascal-based Instructional Language (PIL 2.5) that the Center developed. But the decision to serve a universal base of machines almost guarantees that they can be used only to process

text. This limitation sacrifices the capacity of these programs to use graphics to stimulate interest.

Videodisk Exercises

The Center for Computer-Assisted Learning Instruction also supports and coordinates the development of computer-based videodisk exercises. In addition, computer models of legal reasoning are being developed that use rational decisions based on rules rather than arbitrary decisions, according to John Getsinger, the Center research associate who designs them.

At the IIT Chicago-Kent College of Law, an automated form drawer is being designed by Professor James Sprowl and Ron Staudt. This system asks a series of questions, the answers to which generate a client file and specialized documents. Unlike some other systems, users can modify the automated drawer system to suit their specific needs.

The IIT Center for Law and Computers is being funded by the American Bar Foundation (ABF), IBM, and the college administration to study the use of personal computers as an aid to legal education. The ABF Processor, a front-end program to simplify use of the computer, will be part of a general software tool kit to help law students appreciate and exploit the computer's capabilities.

The IIT effort should produce more

than a fancy typewriter for law students, Staudt stresses. The tool kit should expose students to a new role—that of an attorney comfortable with sophisticated

computer technology. Staudt foresees tools for the computer that focus on how students learn to think like lawyers and that mimic the best legal thinking. ■

Disks out of control? Tame that data.

With the disk management
tools of

The Norton Utilities.™

Featuring the Hard Disk Helpers.

If you've got a fixed hard disk or stacks of diskettes you know how tough it can be to keep track of it all. Enter **The Norton Utilities, Version 3.** Practical disk management tools. They find those files. They show those directories. They search for data. They put your directories in order. They're the hard disk helpers (for diskettes, too).

Lost your data?

Bring 'em back alive.

Through the magic of file recovery with

The Norton Utilities

Featuring the legendary **UnErase™**

Life insurance for Your Data

If you've ever lost vital data, you know what it's like. If you haven't, consider yourself lucky. Enter **The Norton Utilities, Version 3.** Honest to gosh file recovery. Featuring the legendary **UnErase.** If it can be done, we'll bring 'em back alive. Can you afford to be without it? It's life insurance for your data.

Twice voted "World Class" best utilities - PC World Winner of Softalk popularity poll! Softset best-seller. The N.Y. Times says, "don't compute without them." Users groups "They set a standard for the industry."

Data recovery Disk management

Norton Utilities

and more!

The Norton Utilities, Version 3.
Featuring the legendary **UnErase.**
Everybody says they're terrific.
We say they're **\$99.95.**

Got an old version? Upgrade for **\$25.**
Just send a check and your old disk.

New Version 3!
More features!
Complete disk support!
Works with nearly any disk
and nearly any DOS computer



Nobody does it like Norton

The Norton Utilities

available at Computerland, other
dealers or order direct for \$99.95:
Peter Norton
2210 Wilshire Blvd.
Santa Monica, CA 90403
Phone orders (213) 399-3948
Visa and Mastercard welcome



IIT Center for Law and Computers

77 South Wacker Dr.
Chicago, IL 60606
(312) 567-6800

CIRCLE 649 ON READER SERVICE CARD

Center for Computer-Assisted

Legal Instruction (CCALI)

Law Center
229 Nineteenth Ave. South
Minneapolis, MN 55455
(612) 373-5352

CIRCLE 648 ON READER SERVICE CARD

CIRCLE 346 ON READER SERVICE CARD

SAVE



- Low Low Prices
- Same Day Shipping
- No Surcharge for Credit Cards
- Open from 9 AM to 9 PM EST (Mon. - Sat.)

SAVE

1-800-237-4048

(ORDERS ONLY)

COMPUTERS

DISPLAY CARDS

PRINTERS

IBM

PC, 2 DSDD DRIVES, 256K	1695
XT, 1 DSDD/10MB, 256K	2595
AT, 1 QD/20MB, 512K	5595
PORTABLE, 2 DSDD, 256K	2214

COLUMBIA

PC, 2 DSDD, 128K	1890
XT, 1 DSDD/10MB, 128K	3164
PORTABLE, 2 DSDD, 128K	2030

TELEVIDEO

PC, 2 DSDD, 256K	1960
PC, 2 DSDD, 256K, COLOR	2263
XT, 1 DSDD/10MB, 256K	3472
XT, 1 DSDD/10MB, 256K, COLOR	3623
PORTABLE, 2 DSDD, 256K	1706

MONITORS

AMDEK

300, GREEN	129
300, AMBER	139
310A, AMBER	149
600, RGB COLOR	419
710, SUPER HI RES COLOR	549

PRINCETON

MAX-12, AMBER	169
HX-12, RGB COLOR	499
SR-12, SUPER HI RES/DOUBLER	879

QUADRAM

AMBERCHROME, MONO	169
QUADCHROME 2, RGB COLOR	429

HERCULES

COLOR CARD/PRINTER PORT	159
MONOCHROME GRAPHICS	310

MULTI-FUNCTION CARDS

AST

SIX PACK PLUS, 64K, CSP	255
MEGAPLUS, 64K TO 512K	255
MP-2, 64K TO 384K, CLOCK	223
ADVANTAGE, TO 3MB FOR AT	CALL
HALF CARD MEMORY, 64K TO 256K	190
HALF CARD I/O, CS	119

QUADRAM

QUADBOARD, OK, CSPG	229
---------------------------	-----

MODEMS

HAYES

300 BAUD	199
300/1200 BAUD	449
1200B, INTERNAL	369

MISCELLANEOUS

MEMORY, 64K	27
KEYTRONICS 5151 KEYBOARD	199
PRINTER STANDS FROM	19
FLIP-N-FILE	19
THE SOURCE SUBSCRIPTION	33
PRINTER CABLE	29
MODEM CABLE	29
VERBATIM DISKS, DSDD	19
BASF DISKS, DSDD FOR AT	65
MICROFAZER BUFFER, BK	129
MICROFAZER BUFFER, 64K	213

OKIDATA

82A	299
83A, WIDE CARRIAGE	556
84P, WIDE CARRIAGE	609
92P	389
93P, WIDE CARRIAGE	599
2350P	1790
2410P	1790
TRACTOR FOR 82/92	49

EPSON

RX-80	249
RX-80, WITH TRACTOR	299
RX-100 WIDE CARRIAGE	405
FX-80, WITH TRACTOR	429
FX-100, WIDE CARRIAGE	639
LQ-1500	1159

NEC

2050	699
3550	1399
8550	1811
BI-DIRECTIONAL TRACTOR	154
CUT SHEET GUIDE	64

JUKI

6100	389
6300	747
BI-DIRECTIONAL TRACTOR	129
SINGLE SHEET FEEDER	200

MPI

SPRINTER	463
SPRINTER X	540
TRAVEL LID	38



COMPUTER MART
1901 S. TAMiami TRAIL
VENICE, FL 33595

Call for Non-Advertised Items and Lower Current Prices
IBM is a Registered Trademark of International Business Machines.
Prices subject to change. We accept MasterCard, VISA, Money
Orders, certified and personal checks and COD shipments.



IN FLORIDA CALL 813-493-2736

Print Sideways

A many-columned spreadsheet usually overflows a single sheet of paper and requires a cut-and-paste job. Printing sideways gives you more spreadsheet columns with less piecing together.



Spreadsheet software is well entrenched in today's office. Because of the spreadsheet's strengths and capabilities, users often create schedules with more columns than will fit on a single sheet of paper. To help the spreadsheet user, Funk Software, Inc., has developed *Sideways*.

As its name implies, *Sideways* turns the printed output 90 degrees so that the spreadsheet column headings occupy the 11-inch side of an 8½-by-11-inch sheet of paper, or the 14-inch side of an 11-by-14-inch sheet of paper. It allows an almost unlimited number of columns (more than 65,000 characters) on a continuous line of output. *Sideways* elimi-

nates the need to cut and paste together multiple sections of a printout. The software works well with continuous feed paper, but neither the documentation nor my experimentation produced a way to use single sheets.

Besides spreadsheet print files, *Sideways* will also work with any ASCII print file, which produces charts or other output with a horizontal line that won't fit on a single sheet of paper.

Besides turning the output 90 degrees, *Sideways* also allows you to set the type size (from 14.4 characters per inch to 4.5 characters per inch), line spacing (from 8 lines per inch to 0.65 lines per inch), character spacing, left and top margins,

double strike, and form size. These features are easily selected through a one-screen setup menu that is completely self-documented and clear.

Printing

Sideways requires that you print your spreadsheet report to a print file instead of directly to the printer. When you are ready to produce your report, you must exit the spreadsheet software, execute *Sideways*, select the appropriate feature options, and enter the print filename and type P. Within a few seconds, your report will begin to print.

If you instruct *Sideways* to begin to print and it detects that the printer is not operating, it prompts you to turn on the printer. But once in operation, *Sideways* does not have the ability to detect a printer error, and it will continue to send data. During printing, you can abort a job by simply typing P. The printer will stop and advance the paper to the top of the next page, and *Sideways* will await further instructions.

Sideways will increase printing time. Considering, however, that it ignores the printer's character sets, generates its own characters rotated 90 degrees, and recombs (cuts and pastes) the output, it is worth the extra time. Use of a print spooler, however, will intolerably increase printing time. (continued)

ANNOUNCING creative computing's 1984 BUYER'S GUIDE

TO PERSONAL
COMPUTERS &
PERIPHERALS



Advice you can trust on selecting personal com- puters, peripherals and electronic games

Unless you have the memory of a computer there's no way you can keep track of all the games, programs and peripherals available for your computer. And even if you could, you'd still have a problem figuring out what's best for your needs and how to get the most for your money.

That's why you need the 1984 Buyer's Guide to Personal Computers & Peripherals. It's a comprehensive collection of product reviews and consumer-oriented shopping advice put together by the experts at *Creative Computing* magazine.

You'll get a rundown of what's new on the market. Analysis of new product performance, reliability, operation, applications, cost—even what kind of repair service you can expect. Easy-to-understand comparisons between different models. Tips on bugs and design problems. Plus "inside" information you won't get from manuals or salespeople.

Don't buy until you've consulted the 1984 Buyer's Guide to Personal Computers & Peripherals! Order your copy today.

Send to:
Creative Computing Buyer's Guide
CN 1914, Morristown, NJ 07960

YES! Please rush me *Creative Computing's 1984 Buyer's Guide to Personal Computers & Peripherals*. Enclosed is my check or money order for \$3.95 plus \$1 for postage and handling.

Mr./Mrs./Ms. _____ (please print)

Address _____

City _____

State _____ Zip _____

Please make check payable to Creative Computing Buyer's Guide, CA, NJ and NY State residents please add applicable sales tax. Prices outside U.S.A. in \$.

BUSINESS

Glue Lines

Although *Sideways* is simple to use, it has a confusing feature—the correct setting of the "glue lines" option, which internally cuts apart the spreadsheet and pastes together the sections. Two pages of the 17-page documentation plus a 1-page errata sheet for 1-2-3 are devoted to glue lines. Unfortunately, this section is a bit confusing.

Setting the glue lines feature is necessary so that *Sideways* can offset the right-margin limit in the spreadsheet—the feature that sections the output so that you cannot print more characters on a horizontal line than the paper accommodates. With the glue lines setting, you indicate the number of output lines so that *Sideways* will know how to put a sectioned spreadsheet back together again. When you set the glue lines, remember that the number of output lines includes the rows in the spreadsheet plus the header, footer, and top and bottom margins.

You may need to experiment with the glue lines setting or list the output file using EDLIN. Fortunately, glue lines need to be set only when you use *Sideways* in conjunction with spreadsheet software that has a right margin limit or that requires more lines on a page than *Sideways* can accommodate. In most cases, you can completely ignore them.

PO FACT FILE

Sideways

Funk Software, Inc.
P.O. Box 1290
Cambridge, MA 02238
(617) 497-6339

List Price: \$60

Requires: 64K RAM, parallel or serial printer interface, and one of the following printers: IBM Graphics Printer; Epson MX-80 or 100 or FX-80 or 100; Okidata Microline 82A, 83A, 92A, 93A, or 84 (step 2); C. Itoh Prowriter; or IDS (Dataproducs P-Series) Prism 80 or 132, or Micro-Prism 460 or 560.

CIRCLE 694 ON READER SERVICE CARD

Installation of *Sideways* is easy: You copy two of the three files that come on disk (SIDEWAYS.COM and INSTALL.EXE), run the INSTALL.EXE program, and answer two prompts about your printer—presto, the program is installed. After you run the installation program, execute SIDEWAYS to create the default features on the setup menu.

Sideways is the perfect finishing touch for a long, many-columned spreadsheet.

Finally, since it requires only 16K on the floppy, you should copy the installed version of *Sideways* (SIDEWAYS.COM) and the default setting file (SIDEWAYS.DFT) to the working copy of your spreadsheet software, enabling you to use *Sideways* after creating the print file without shuffling disks.

The 17-page manual is clear and concise. After reading it, you will probably not refer to it again until you set the glue lines.

The program is easy to operate, but if you need technical support, the staff at Funk Software is courteous and helpful.

I have used *Sideways* with Lotus's 1-2-3, WordStar, VisiCalc, and Milestone without difficulty. The version of *Sideways* that I tested (2.01) supports 18 serial or parallel printers; I've used it successfully with the IBM Graphics Printer, Epson FX-100, and the Okidata 92 and 84. It did not operate correctly, however, with an Okidata 93 with the IBM Plug 'n' Play kit installed. (Calls to technical support at both Okidata and Funk Software confirmed a problem with the Plug 'n' Play kit, and Okidata is working on it.)

For \$60, *Sideways* is a great value—the perfect finishing touch for a long, wide, many-columned spreadsheet. ■

PC User Groups

This list is a partial directory of PC user group names and addresses. Use this listing to locate other PC aficionados who congregate in your area or around the world.

ALABAMA

Birmingham IBM PC User Group
c/o Fred Hilbers
P.O. Box 19248
Birmingham, AL 35219
(205) 879-3716

Huntsville IBM PC User Group
P.O. Box 16013
c/o John Coyle
Huntsville, AL 35802
(205) 883-9580

Montgomery PC Users Club
c/o Tony Drake
3505 McGehee Rd.
Montgomery, AL 36111
(205) 281-6100

The Greater Gulf Coast Users Group
c/o Jim McGinnis
124 Meadow Wood Loop
Daphne, AL 36526
(205) 626-9558



ALASKA

**The IBM PC and PC Compatible
Computer Users Group**
3605 Arctic Blvd., #1320
Anchorage, AK 99503

ARIZONA

Phoenix IBM-PC Users Group
P.O. Box 44150
Phoenix, AZ 85064
(602) 954-7519

Tucson IBM PC Users Group
P.O. Box 1489
Tucson, AZ 85702
(602) 795-9437

CALIFORNIA

Stanford/Palo Alto User Group
c/o Linda de Sosa
P.O. Box 3738
Stanford, CA 94305
(415) 856-6281

**Stanford University Hospital
Personal Computer Society**
c/o Kevin E. Volkman
701 Welch Rd., #310
Palo Alto, CA 94305

IBM PC User Group
c/o Lee Wersel
7255 Orchard Dr.
Gilroy, CA 95020

Berkeley PC Users Group
c/o Mike Morearty
2601 Warren St.
Box 6
Berkeley, CA 94720

PC will publish a periodic listing of PC user groups. Send new addresses or address changes to Club News, PC, One Park Ave., New York, NY 10016. New groups and address changes are shown entirely in **boldface**.

CLUB NEWS

Modesto-Turlock IBM PC User Group

P.O. Box 5122
Modesto, CA 953552

IBM Users Group of California

c/o Neil Zachary
P.O. Box 4136
Los Angeles, CA 90078
(213) 937-1314

The Riverside IBM Computer Club

c/o Jim Heidecke
7860 Live Oak Dr.
Riverside, CA 92509

North Orange County IBM Club

c/o Glenn A. Emigh
P.O. Box 665
La Mirada, CA 90637
(714) 522-0586
(213) 944-9651

Sacramento IBM-PC Users Group

c/o George Lefler
P.O. Box 685
Citrus Heights, CA 95610

Diablo Valley PC

c/o Alfred Hunt
1415 Oakland Blvd., #101
Walnut Creek, CA 94596
(415) 923-1761

Cubic Computer Club

c/o Pete Nelson
Cubic Corporation
9333 Balboa Ave.
P.O. Box 85587
San Diego, CA 92122
(619) 277-6780

San Francisco IBM PC User Group

c/o Charlie Vella
4411 Geary Blvd., #33
San Francisco, CA 94118
(415) 387-2315

Pasadena IBM User's Group

c/o Steve Bass
711 E. Walnut St.
Pasadena, CA 91101
(818) 795-2300

Valley Blue IBM PC User Group

c/o L.E. Peck
P.O. Box 808
Livermore, CA 94550

Marin/Sonoma IBM-PC Users

c/o William O. Ward
21 Tamal Vista Blvd., #186
Corte Madera, CA 94925
(415) 927-1212

San Diego Computer Society

c/o Joe Dornier
P.O. Box 87770
San Diego, CA 92138
(714) 676-5856

Kern IBM PC Users Group

P.O. Box 2780
Bakersfield, CA 93303
(805) 833-0359
KERNCOM
24 hrs. XZmodem, download
and upload, messages.
300/450/1200

UCSF IBM PC User Group

c/o Mark Slichter
School of Nursing
N-319Y
U.C., San Francisco
San Francisco, CA 94143
(415) 666-2763

Pomona Valley IBM PC User Group

c/o Roy Livingston
10282 Felipe St.
Montclair, CA 91763
(714) 624-9194

Bay Area User Group

c/o Christian Du Lac
P.O. Box 155
San Francisco, CA 94101
(415) 668-4647

Silicon Valley Computer Society

c/o Elvin H. Bollet
P.O. Box 60506
Sunnyvale, CA 94088
(408) 243-1154

San Fernando IBM PC Users Group and Studio City Computer Club

c/o David Nussbaum
11558 Riverside Dr., #207
North Hollywood, CA 91602

Peninsular IBM PC Users Group

c/o Friendly Software Corp.
376 El Camino Real
San Carlos, CA 94070

Greater South Bay IBM PC Users Group

Mark Perlstein
9903 Santa Monica Blvd., #137
Beverly Hills, CA 90212
(213) 839-3459

Thousand Oaks Personal Computer Club (TOPCC)

c/o P. Larson
1264 El Monte Dr.
Thousand Oaks, CA 91362

San Francisco IBM PC Club

P.O. Box 661
San Francisco, CA 94101

Fresno IBM-PC Users Club

P.O. Box 5987
Fresno, CA 93755

Redding's Unusual Computer User Society

c/o Erik Anderson
6055 Chum Creek Rd.
Redding, CA 96002
(916) 221-3633

SLO Bytes of California Central Coast

c/o Richard N. Racouillat
605 Santa Rosa St.
San Luis Obispo, CA 93401

(Calif. listings to be continued in a future issue)

New On The Market

HARDWARE

Model 700 Word Image Processing System

An image capture/processing system that interfaces directly with most popular IBM PC word processing and database management programs. The system allows users to create complex documents and databases that integrate images, text, and numeric data.

The Model 700 system consists of the Model 210 Image Scanner, the Model 111 Imaging Interface, WIPS software, and interconnect cable. Image capture is via the Image Scanner, a desktop device with front-panel/software-selectable controls for image contrast setting, half-tone pattern, and operation. This flatbed scanner can accept 8½- by 11-inch or smaller documents. Resolution of the scanned image is 200 dots per inch across the horizontal scan line; the user can select 200, 150, or 100 lines per inch along the vertical axis.

Once an object or document has been scanned, the WIPS software is used to create an image of the proper size and content for inclusion in the document being prepared. Images can be segmented, reduced or enlarged, stored to disk,

displayed, and printed, as well as merged with text or data files. Optional software allows the conversion of text images to ASCII for subsequent manipulation of combined files.

(List Price: under \$4,000)
Datacopy Corp.
1215 Terra Bella Ave.
Mountain View, CA 94043
(415) 965-7900

CIRCLE 660 ON READER SERVICE CARD

Magstripe Models 41 and 61

Two magnetic stripe readers that interface directly with the user's system via standard RS-232 or RS-449 serial interfaces. The Magstripe readers output straight ASCII characters, eliminating the need for special software.

Model 41 is a standalone unit, while Model 61 is a component-level unit intended to be built into a separate enclosure. Both models are configurable to the user's specific application, linking to the user's system via the serial interface.

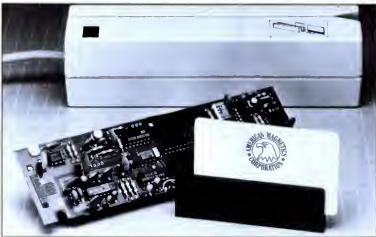
The Magstripe readers allow the user to define magnetic track numbers and densities, rates of transmission, as well as parity and handshaking protocols compatible with the user's software. A built-in buffer accommodates applications where the controller cannot accept data on a real-time basis. LED indicators provide the user with immediate status feedback.

Both units feature diag-

nostics and patented Spatial Decoding circuitry that provides reliable reading of cards with warped and contaminated magnetic stripes. The read heads used perform despite variations in card speed, card amplitude, and excessive jitter.

Power for either model can be supplied from either a +5 VDC power supply or a 115 VAC adapter. Power supplies are available from the manufacturer or from outside suppliers. (List Price: Model 41, \$325; Model 61, \$199; power supply, approx. \$15.)
American Magnetics Corp.
740 Watsoncenter Rd.
Carson, CA 90745
(213) 775-8651

CIRCLE 661 ON READER SERVICE CARD



Magstripe Models 41 and 61, American Magnetics Corp.

BUY HARDWARE AND SOFTWARE AT WHOLESALE +8%, AND GET 14-28 DAY SOFTWARE RENTALS† . . .

In just the last few months, **The NETWORK** has saved its members more than \$24,000,000 and processed over 60,000 orders.

Listed below are just a few of the over 20,000 products available at our **EVERYDAY LOW PRICES!** All software below is priced in IBM-PC format.

The nation's largest corporations depend on PC NETWORK!

On our corporate roster are some of the nation's largest financial industrial and professional concerns including some of the most important names in the computer industry:

AT&T	General Motors
Barclays Bank	Gillette
Bell & Howell	Hewlett Packard
Citibank	Hughes Aircraft
Columb University	IBM
Data General	ITT
Exxon	Kodak
Farm Bureau Insurance	Multimate
Frontier Airlines	Standard Oil of Ohio
General Mills	Yale University
General Electric	Veteran's Administration

plus thousands of satisfied consulting firms, small businesses, user groups, municipalities, government agencies and value-wise individuals **ACROSS THE NATION!** Their buyers know that purchasing or renting from **PC NETWORK** saves them time, money and trouble. They also count on us for product evaluation, professional consultation and the broadest spectrum of products and brands around.

CALL TOLL FREE 1-800-621-S-A-V-E

In Illinois call (312) 280-0002

Your Membership Validation Number: **A165**

You can validate your membership number and, if you wish, place your first money-saving order over the phone by using your **VISA, MASTERCARD** or **AMERICAN EXPRESS**. Our knowledgeable service consultants are on duty **MON-FRI 9 AM to 7 PM, SAT 9 AM to 5 PM CST.**



PERSONAL COMPUTER NETWORK
320 West Ohio
Chicago, Illinois 60610

Call now... Join the PC NETWORK and start saving today!

PC NETWORK • MEMBERSHIP APPLICATION

YES! Please enroll me as a member in the PC NETWORK* and rush my catalog featuring thousands of computer products, all at just 8% above **DEALER WHOLESALE PRICES**. I will also periodically receive "THE PRINT-OUT," a special up-to-date on merchandise at prices **BELOW** even those in my wholesale catalog, and at the other exclusive, money-saving services available to Members.

I am under no obligation to buy anything. My complete satisfaction is guaranteed. Please check (✓) all boxes that apply:

- | | |
|---|---|
| Basic Membership | Special V.I.P. Membership* |
| <input type="checkbox"/> One-year membership for \$8 | <input type="checkbox"/> One-year membership for \$15 |
| <input type="checkbox"/> Two-year membership for \$15 (SAVE \$1) | <input type="checkbox"/> Two-year membership for \$25 (SAVE \$5) |
| <input type="checkbox"/> Business Software Rental Library for \$25 add'l per year—with 14 day rentals | <input type="checkbox"/> BOTH Business and Game Software Rental Libraries for \$30 add'l per year—with 28 day rentals |
| <input type="checkbox"/> Games Software Rental Library for \$10 add'l per year | <input type="checkbox"/> *VIP members receive advance notice on limited quantity merchandise specials |
| <input type="checkbox"/> Bill my credit card: <input type="checkbox"/> VISA <input type="checkbox"/> MasterCard <input type="checkbox"/> American Express | |

Account Number: _____ Exp. _____

mo. year

☐ Check or money order enclosed for \$ _____

Name _____ Apt. No. _____

City _____ State _____ Zip _____

Telephone () _____
My computer(s) is/are: ☐ IBM PC ☐ IBM XT ☐ IBM AT ☐ Apple II ☐ Macintosh ☐ Other _____

Signature _____ (Signature required to validate membership)

Copyright © 1984, PC NETWORK, INC.

GAMES & EDUCATIONAL SOFTWARE

(Prices add \$2.00 shipping and handling for each title ordered from below.)

Blackjack Chess (Four Tournament Editions)	\$ 34.95	Swimming Academy (swims with movie card)	\$ 19.95*
Blackjack Chess (Four Tournament Editions)	\$ 34.95	Swimming Academy (swims with movie card)	\$ 19.95*
Blackjack Chess (Four Tournament Editions)	\$ 34.95	Swimming Academy (swims with movie card)	\$ 19.95*
Blackjack Chess (Four Tournament Editions)	\$ 34.95	Swimming Academy (swims with movie card)	\$ 19.95*
Blackjack Chess (Four Tournament Editions)	\$ 34.95	Swimming Academy (swims with movie card)	\$ 19.95*
Blackjack Chess (Four Tournament Editions)	\$ 34.95	Swimming Academy (swims with movie card)	\$ 19.95*
Blackjack Chess (Four Tournament Editions)	\$ 34.95	Swimming Academy (swims with movie card)	\$ 19.95*
Blackjack Chess (Four Tournament Editions)	\$ 34.95	Swimming Academy (swims with movie card)	\$ 19.95*
Blackjack Chess (Four Tournament Editions)	\$ 34.95	Swimming Academy (swims with movie card)	\$ 19.95*
Blackjack Chess (Four Tournament Editions)	\$ 34.95	Swimming Academy (swims with movie card)	\$ 19.95*

BUSINESS SOFTWARE

(Prices add \$2.00 shipping and handling for each title ordered from below.)

ATTN: Home Office Software	\$ 34.95	Call	\$ 19.95*
ATTN: Home Office Software	\$ 34.95	Call	\$ 19.95*
ATTN: Home Office Software	\$ 34.95	Call	\$ 19.95*
ATTN: Home Office Software	\$ 34.95	Call	\$ 19.95*
ATTN: Home Office Software	\$ 34.95	Call	\$ 19.95*
ATTN: Home Office Software	\$ 34.95	Call	\$ 19.95*
ATTN: Home Office Software	\$ 34.95	Call	\$ 19.95*
ATTN: Home Office Software	\$ 34.95	Call	\$ 19.95*
ATTN: Home Office Software	\$ 34.95	Call	\$ 19.95*
ATTN: Home Office Software	\$ 34.95	Call	\$ 19.95*

HARDWARE

(Prices add \$2.00 shipping and handling charges listed in tables next to price.)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)
Apple Macintosh Base System	\$1,889.00 (24.22)	Apple IIe Plus Expansion Card	\$115.00 (-1.75)

PRINT BEFORE YOU BUY!—Members are eligible to join **The NETWORK's** Business and Game Software Rental Libraries and evaluate products for a full 14 (Regular) or 28 (VIP) days to see if it meets your needs. And **The NETWORK's** rental charges are far less than other software rental services—JUST 25% OF THE MEMBER WHOLESALE PRICE.

Hardware prices highlighted by * reflect recent major price reductions

*PC NETWORK Members pay just 8% above the wholesale price, plus \$2.00 shipping and handling. A 2% cash discount. Minimum shipping \$20 per order.

Digital NetCommander

A standalone networking device allowing up to 48 personal computers and peripherals to be linked together without hardware or software modifications.

The basic Digital NetCommander network exchange connects from 4 to 16 devices and can handle multiple protocols, baud rates, and terminal switching, with message store-and-forward and port contention management features. It can be linked to other Digital NetCommanders of varying capacities and can act as a server in a larger LAN installation. Port names are definable, routing is automatic, and contention paths can be established without special access codes.

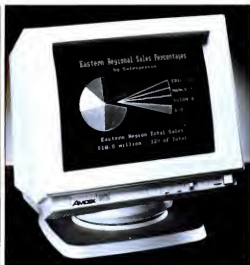
(List Price: \$1,095—\$2,950, depending upon configuration)
 Digital Products, Inc.
 600 Pleasant St.
 Watertown, MA 02172
 (800) 243-2333
 (617) 924-1680

CIRCLE 662 ON READER SERVICE CARD

Model P16 Printer Buffer

A Centronics parallel print buffer designed to accept and store files to be printed, freeing the user's system for other tasks.

The buffer's memory of



Color 700 Series, Amdek Corp.

from 16K to 64K is upgradable simply by plugging in memory chips.
 (List Price: \$119)
 Digital Devices Corp.
 430 Tenth St., #N205
 Atlanta, GA 30318
 (800) 554-4898
 (404) 872-4430

CIRCLE 663 ON READER SERVICE CARD

Citizen MSP Dot Matrix Printers

Two dot matrix printers featuring print speeds of up to 160 characters per second, a correspondence mode, and graphics printing capability. The printers, designated the Citizen MSP-10 and the Citizen MSP-15, can print 80 columns and 136 columns, re-

spectively.

The Citizen MSP printers are compatible with the Epson and IBM printer command sets. They offer a choice of pica, elite, italic, and reverse printing type fonts, as well as compressed, emphasized, and double-strike modes.

The printers also feature user-replaceable printheads, bidirectional printing in text mode, and unidirectional printing in graphics mode.
 (List Price: MSP-10, \$499; MSP-15, \$749)

Citizen America Corp.
 2425 Colorado Ave., #300
 Santa Monica, CA 90404
 (213) 453-0614

CIRCLE 664 ON READER SERVICE CARD

Color 700 Series Monitors

Two RGB-TTL color monitors providing resolutions of 720 dots by 240 lines (noninterlaced). A built-in, switchable color matrix allows the monitors to display 16 colors simultaneously. For text displays, the Color 700 Series can provide 96 columns by 25 lines, in either white or green.

Both the Color 700 and the Color 710 have tilt/swivel bases and front panel controls for contrast, brightness, text color, and power. The Color 710 adds an etched glass CRT to reduce glare for easier viewing. The 710 monitor also features a long-persistence phosphor to provide greater vertical resolution (up to 480 lines).

(List Price: 700, \$749; 710, \$799)
 Amdek Corp.
 2201 Lively Blvd.
 Elk Grove Village, IL 60007

(312) 595-6890
 Telex: 28-0803

CIRCLE 665 ON READER SERVICE CARD

REACH!

A half-size, 1,200-bps modem offering both half- and full-duplex communications, a high signal-to-noise ratio for use even over low grade phone lines, and compatibility with the Hayes

HARDWARE

Smartmodem command protocol. Other features of the modem include call progress monitoring with indication of a call's status, with an on-board speaker to give audible indication. It supports both a local loopback test mode and a remote diagnostics mode.

Included with the REACH! modem is the CROSSTALK XVI async communications program by Microstuf, Inc., at no additional charge. (List Price: \$549) AST Research, Inc. 2121 Alton Ave. Irvine, CA 92714 (714) 863-1333

CIRCLE 666 ON READER SERVICE CARD

Data-Mac HDSTs

A 40-key, hand-held data storage terminal (HDST) with either 8K (Data-Mac 8) or 16K (Data-Mac 16) internal memory and a 32-character LCD display. The HDSTs are designed for field use by persons gathering data for later transfer into an IBM PC. Two features, Memory Sentry and Power Sentry, in concert with the unit's all-CMOS circuitry, protect stored data against accidental erasure or loss for up to 15 years without battery recharging.

The units transfer their memory contents to the user's system either by direct

serial or parallel connection, or by modem over phone lines. The 40-key plate has numbers in a 10-key calculator style setup, with alpha keys organized alphabetically. All keys can be customized with legends and functions as needed by the user.

(List Price: 8K, \$1,295) Definable Data Devices, Inc. P.O. Box 769 Wilsonville, OR 97070 (503) 682-3131

CIRCLE 667 ON READER SERVICE CARD

Davong System Tape Unit

A 24-megabyte start-stop cartridge tape drive that can operate either as a floppy/hard disk backup unit or as a memory storage device directly addressable by PC-DOS. The drive uses inexpensive 3M

DC-600A cartridges, each of which can store the equivalent of 75 IBM PC double-sided diskettes.

Used as a storage device under PC-DOS, the Davong System Tape Unit acts as a 24-MB floppy disk, addressable by standard DOS commands and utilities. When operated under the manufacturer's menu-driven *Tape Manager Program*, the device can back up a hard disk drive at a transfer rate of one million characters per minute. The *Tape Manager Program* compresses data during the backup process, with automatic flaw mapping that permits reliable data transfers between hard disks. A "mirror-image" backup option is also available for later restoration of data to the same hard disk.

(List Price: With power

supply, \$1,895; without power supply, \$1,695) Davong Systems, Inc. 217 Humboldt Ct. Sunnyvale, CA 94089 (408) 734-4900

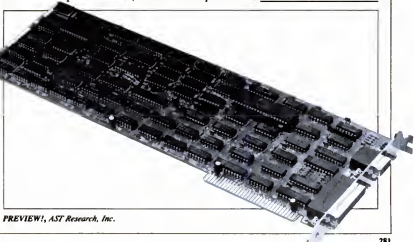
CIRCLE 668 ON READER SERVICE CARD

PREVIEW!

A monochrome display adapter with parallel port. The board supports the 720 x 380 resolution capability of the IBM monochrome monitor with bit-mapped monochrome graphics features. Also included with the PREVIEW! board are the SuperDrive RAMdisk and SuperSpool print-spooling utilities.

(List Price: \$399) AST Research, Inc. 2121 Alton Ave. Irvine, CA 92714 (714) 863-1333

CIRCLE 669 ON READER SERVICE CARD



PREVIEW!, AST Research, Inc.

SOFTWARE

RELIEF

A menu-driven program for executing DOS commands and loading applications programs such as Lotus's 1-2-3, dBASE II, and WordStar. A procedure is provided for the inclusion of user-designed secondary menus created with any text editor. *RELIEF* also manages subdirectories to organize files on fixed disk systems.

(List Price: \$89.95)

Requires: 128K RAM, two drives, PC-DOS 2.0.
R.E.B. Enterprises
 2010 Clairmeade Vly. Rd.
 Atlanta, GA 30329
 (404) 321-3614

CIRCLE 670 ON READER SERVICE CARD

Clinical Research Systems

A system for managing and analyzing clinical research data and maintaining patient records. The system comes in three upgradable versions: *CRS I*, for the individual practitioner; *CRS II*, for multiple-researcher offices; and *CRS III*, for large organizations. Each of the systems is menu driven and includes entry, selection, and analysis of data with statistics and graphs.

CRS II adds pie and bar charts, additional statistics and data-transfer capabilities,



Printworks, SoftStyle, Inc.

ties, and cross tabulations to the basic system. *CRS III* provides data security and integrity functions, patient and physician scheduling routines, a data audit feature, and data transfer and update from remote site capabilities.

(List Price: *CRS I*, \$900; *CRS II*, \$1,800; *CRS III*, \$3,000)

Requires: 128K RAM, two disk drives, PC-DOS, color/graphics adapter.
International Medical Products Corp.
 4503 Moorland
 Minneapolis, MN 55424
 (612) 835-4018

CIRCLE 671 ON READER SERVICE CARD

Printworks

A menu-driven printer configurator program compatible with over 30 different dot matrix printers. On-screen menus allow the user to select print pitch, type font, print mode, and page format. It also supports sideways printing, fitting wide documents such as spreadsheets onto standard fanfold paper.

Printers supported by the program include the Epson, Okidata, C. Itoh, and Star Micronics lines. Other printers include the IBM Graphics Printer, the Inforunner Riteman series, the NEC Pinwriter P2-2 and P3-3, and the

Centronics Horizon H80 and H136.

Other features of the software include a unidirectional option (by which all printing is done left to right only) for aligning line graphics; a quiet mode setting, by which the printer is commanded to operate at reduced speeds; and a typewriter mode, which prints each character as it appears on the screen.

(List Price: \$69.95)

Requires: 64K RAM, one disk drive, PC-DOS, compatible dot matrix printer.

SoftStyle, Inc.
 7192 Lalanianole Hwy., #205
 Honolulu, HI 96825
 (808) 396-6368
 Telex: 35-3338

CIRCLE 672 ON READER SERVICE CARD

CAPEM-T

A thoroughbred horse race handicapping program. With data obtained from Daily Racing Forms, CAPEM-T allows the user to determine the most likely winners in a race under any weather and track conditions.

(List Price: \$49.95)

Requires: 64K RAM, one disk drive, PC-DOS.
Tri Soft, Inc.
 2649-8 Vista Way, #99
 Oceanside, CA 92054
 (619) 439-0744
 (213) 470-3489

CIRCLE 673 ON READER SERVICE CARD

PC-DOS Help Function

A program in the public domain providing on-screen help for all PC-DOS 2.0 and 2.1 commands. The software contains two levels of help screens: a summary version and a detailed explanation of commands.

The text of the help screens may be altered by the user, allowing customized descriptions or notes to be added. Additional help screens can be added as well, allowing the program to serve as a general Help notebook for the user's applications.

Copies of the program can be obtained free of charge through a wide range of user groups and on-line users' bulletin boards. Copies may also be obtained directly from the author for a nominal fee to offset costs.

(Disk Charges: First copy, \$10; Additional copies, \$25)

Requires: 64K RAM, one disk drive, PC-DOS 2.x.

C. Bailey
P.O. Box 332
Peterborough, Ont.
Canada K9J 6Z3

CIRCLE 674 ON READER SERVICE CARD

NSL Diet Analyzer

A nutrition analysis program combining features of a spreadsheet with a built-in database of nutritional

data on 500 foods. Analysis is based on calories, protein, total fat, saturated fat, mono- and polyunsaturated fats, cholesterol, carbohydrates, fiber, calcium, phosphorus, iron, sodium, potassium, magnesium, vitamin A, thiamin, riboflavin, niacin, vitamin C, and four user-definable elements.

As the user enters a meal or snack into the software's spreadsheet component, the nutritive value is compared against the database of foods. Meal elements can be manipulated on-screen to achieve desired food values in a diet. The food database is expandable to up to 1,900 foods and recipes.

(List Price: \$49.95)

Requires: 128K RAM, one disk drive, PC-DOS. Natural Software Ltd.
7 Lake St., #7E
White Plains, NY 10603
(914) 761-9329

CIRCLE 675 ON READER SERVICE CARD

Direct Access

A hard disk management and access program allowing the user to execute programs with a single keystroke. *Direct Access* organizes files stored on the hard disk into a user-defined menu system. Requiring no restructuring of the hard disk's organization, the program crosses subdirectory boundaries as

needed, eliminating repeated keying. In users' systems equipped with internal clocks, *Direct Access* automatically boots day, date, and time into the system.

Features of the program include menu screens, batch-file processing, DOS command execution, function-key usage, and menu security system.

(List Price: \$59.95)

Requires: 128K RAM, 10-MB hard disk, PC-DOS.

Delta Technology
1325 Summit St.
P.O. Box 1104
Eau Claire, WI 54701
(715) 832-0958

CIRCLE 676 ON READER SERVICE CARD



NSL Diet Analyzer, Natural Software Ltd.



SmarTerm 125, Persoft, Inc.

SmarTerm 125

A communications program allowing users to link with minicomputer graphics programs. Emulating DEC VT125 terminals, *SmarTerm 125* supports the ReGIS graphics protocol; it can also emulate DEC VT100, VT101, VT102, or the VT52 alphanumeric terminal to run any software used on the host mainframe system.

File transfer functions built into the software enable the user to capture data on disk and to transfer either ASCII or binary files to the host computer without special host software. *SmarTerm 125* includes two error-free protocols, PDIP and *Xmodem*, as well as BASIC and FORTRAN programs to implement the protocols on DEC

VAX/VMS systems.

Virtually all of the features of the VT125 terminal are available to the user, including emulation of positive, vector, curve, text, downloadable character sets, shading, multiple writing planes, custom writing patterns, macrographs, and permanent/temporary writing controls. *SmarTerm 125* also includes the ability to define eight separate setup configurations and provides programmable soft keys to simplify autodial, log-in, file transfer, and other frequently performed tasks.

The software supports 132-column alphanumeric display modes either through horizontal scrolling of an 80-column screen, or directly through the use of 132-column video boards. It also supports European

versions of PC-DOS by including user-definable character mapping tables that translate extended European characters to and from the normal ASCII character range during emulation, file transfer, and print operations.

(List Price: \$295; upgrades from *SmarTerm 100*, \$175.)

Requires: 128K RAM, two disk drives, PC-DOS, async adapter.

Persoft, Inc.
2740 Ski Ln.
Madison, WI 53713
(608) 273-6000

CIRCLE 677 ON READER SERVICE CARD

SKOPOS Human Resource Management Library

A collection of 12 programs assisting the user in automating personnel man-

agement tasks normally performed manually. The *SKOPOS Human Resource Management Library* includes functions in such personnel areas as compensation, benefits, staffing, training, and employee records. Using statistical analysis methods, the software also provides an objective means of defining job descriptions and creating salary ranges for employees, as well as for performing job analyses and evaluations.

Programs in the library include *Applicant Manager*, *Job Analyzer*, *Salary Survey Analyzer*, *Salary Ranger*, *Personal Data Manager I and II*, *Executive Compensation Administrator*, *Job Evaluator*, and *Salary Auditor*. Included in the cost of the software are installation assistance, program customization, customer training, and telephone assistance. Additional programs are planned for future release.

(List Price: *Individual programs*, \$399-\$4,995; *complete library*, \$20,000.)

Requires: 128K RAM, two disk drives, PC-DOS.

SKOPOS Corp.
4966 El Camino Real,
#216
Los Altos, CA 94022
(415) 962-8590

CIRCLE 678 ON READER SERVICE CARD

SOFTWARE

GRAFMATIC

A set of text and graphics utilities, including routines for 2-D plots, 2-D interactive graphics, and 3-D plots and solid modeling. The 60-plus screen graphics routines can be used within FORTRAN subroutines or as Pascal procedure calls.

With **GRAFMATIC**, the programmer can set the date and time, the graphics mode, and the pixel's color or draw lines; fill an area with color; and dump the screen to an Epson printer. It also enables the user to display parametric and tabular plots and bar and pie charts with automatic axes generation and tic-mark labeling. The 3-D routines allow figures to be translated and rotated. Hidden lines can be removed or left for wire frame viewing.

(List Price: \$135)

Requires: 96K RAM, color/graphics adapter, SuperSoft FORTRAN or Microsoft/IBM FORTRAN or Pascal compiler.

Microcompatibles
11443 Oak Leaf Dr.
Silver Spring, MD 20901
(301) 593-0683

CIRCLE 679 ON READER
SERVICE CARD

Dasy

A statistical data analysis system with regression, tabulation, data manipulation, and macro definition capabilities. **Dasy** has five

levels of operation:

- Elementary statistics, with reading, printing, plotting, regression, and tabulation functions.

- Advanced statistics, for model fitting and diagnostic checks.

- DOS interface, for redirecting output to printer or disk, as well as session saving and restoring.

- Foreign program interface, for executing DOS commands and linking statistical data files to word processing and other outside programs.

- Mainframe interface, for linking to the mainframe version of **Dasy**. (List Price: \$150)

Requires: 256K RAM, one disk drive, PC-DOS.

Statistical Software Resources

20355 Seaboard Rd.
Malibu, CA 90265

CIRCLE 680 ON READER
SERVICE CARD

TRUCKSTOPS

A truck fleet routing/dispatching program for developing efficient vehicle loads and route schedules. Designed for use by fleet managers, **TRUCKSTOPS** can be used to minimize fleet sizes, mileage, and operating costs for fleets of five to several hundred vehicles.

The system meets normal industry operating requirements such as customer delivery times, vehicle capaci-

ties, hours of operation, and backhauls management. Users can also interface the program with existing computer data files and other programs, such as order entry and customer invoice systems, to facilitate input of data.

Add-on enhancement modules are available to the basic system for graphics, multiple-day scheduling, and long distance files.

(List Price: \$895;
add-on modules, \$100-
\$500.)

Requires: 192K RAM,
two disk drives, PC-DOS.
MicroAnalytics, Inc.
2054 N. 14th St., #307
Arlington, VA 22201
(703) 841-0414

CIRCLE 681 ON READER
SERVICE CARD

Tune Smith/PC

A program for musical composition, with a menu of preprogrammed music from classical, folk, and pop fields. The user can play the stored compositions at a variety of speeds and can manipulate the range of sounds in a number of ways.

As a tool for new compositions, **Tune Smith/PC** contains a syntax-correcting feature in its editor to assure proper musical notation.

(List Price: \$49.95)

Requires: 64K RAM, one disk drive, PC-DOS.
Blackhawk Data Corp.
307 N. Michigan Ave.
Chicago, IL 60601
(312) 236-8473

CIRCLE 682 ON READER
SERVICE CARD



TRUCKSTOPS, *MicroAnalytics, Inc.*

We Sell Mega-Bytes For Mini-Bucks

**30 Day Money Back Guarantee
1 Year Warranty**

MICROSCIENCE Hard Drive With Western Digital Controller

- Boots From Hard Disk
- Instruction Manual
- Cables and Mounting Hardware
- Full or Half Height Bezel
- Western Digital Controller
- Software
 - ✓ Low Level Format
 - ✓ Head Park Routine
 - ✓ Diagnostics



\$629 10 MB

\$889 20 MB

MEMORY CHIPS



\$25

AST SIX PACK PLUS W/64 K

\$259



**8087
MATH CO-PROCESSOR
CHIP
\$145**

IBM PC®



• PC-2 W/64K Ram **\$1195**

DISK DRIVES



- **AT COMPATIBLE**
1/2, 360K disk drive by Shugart
w/color coordinated
face plate **\$169**
- **FULL HEIGHT**
CDC 9409 or
TM 100-2 **\$159**
- **HALF HEIGHT**
Teac, FD 55B or
Shugart SA455 **\$129**

CompuAdd

"Computers & Add-On Products"



No shipping charges! No credit card charges!

Your order is on the UPS truck within 24 hours!

PRINTERS



EPSON	
RX-80FT	\$299
RX-80	\$249
RX-100	\$425
FX-80	\$449
FX-100	\$649
LQ-1500	\$1149

TEXAS INSTRUMENTS	
T1855 w/Tractor Feed	\$729

JUKI	
6100 (18 CPS, Par-13")	\$429

OKIDATA	
ML 92 (160 CPS, Par-10")	\$399
ML 93 (160 CPS, Par-15")	\$639
ML 84P (200 CPS, Par-15")	\$759

SMITH-CORONA	
D-200(120 CPS, fnc/trac)	
NLQ model	\$439
D-300(140 CPS, fnc/trac)	
NLQ model	\$599

BOARDS

AST	
AST Monograph Plus Lotus 123 graphics on monochrome card, parallel port, clock/calendar (optional serial port)	\$349

AST I/O Plus Serial port, clock, calendar (optional 2nd serial port or parallel port)	\$129
optional serial or parallel port	\$35

AST Memory expansion board w/64K, upgradable to 384K, clock/calendar, includes Superspooler and Super drive	\$239
---	-------

HERCULES	
Monochrome Graphics Card w/parallel port	\$325
Color Graphics Card with parallel port	\$165

PARADISE SYSTEMS	
Multi-display board (both Monochrome & RGB)	\$329

PERSYST	
Monochrome Adapter Card w/parallel port	\$199

QUADRAM	
MultiFunction Board—new expanded Quad Board w/64K (upgradable to 384K), clock/calendar, parallel & serial ports, game port, I/O bracket and Quadmaster software	\$259
Quad Color I color graphics card	\$190
Quad Color II (Add on)	\$229

SOFTWARE

dBase III	\$399
Framework	\$389
VolksWriter deluxe	\$159
Turbo-Pascal	\$45
Wordstar (ProPak)	\$259
Norton Utilities	\$59
Crosstalk XVI	\$129
Hayes Smartcom II	\$110
Koala Pad w/software	\$99
Set-FX +	\$49

MODEMS



HAYES	
Hayes 300 Baud	\$209
Hayes 1200 Baud	\$475
Hayes 1200 B (internal)	\$419

MONITORS

PRINCETON MONITORS	
HX 12 RGB (690x240)	\$475
MAX 12 Amherst Monochrome	\$175

AMDEK	
310 A	\$175
300 A	\$159
300 G	\$149

OUR POLICY We accept Mastercard, Visa, Money Orders, Certified Checks, Personal Checks (allow 10 days for processing), COD, Company/Institutional P.O.'s and Wire Transfers. No credit card surcharge. We do not charge your card until we ship. We pay shipping (UPS ground, fully insured) on orders delivered in continental U.S.A.

Add 5 1/8% sales tax if Texas resident. Prices are subject to change. All equipment carries a new factory warranty. Any return item must be accompanied by a return authorization number.

CALL TOLL FREE For product information, price quotes, technical support and orders call: Within Texas (512) 250-1489. Outside Texas:

(800) 531-5475

CIRCLE 228 ON READER SERVICE CARD

CORPORATE AND INSTITUTIONAL ACCOUNTS Our national accounts division is dedicated to providing the prompt professional service required to keep your business running smoothly. We accept P.O.'s on a net terms basis, offer same day shipping, free fully insured UPS ground shipment. We offer a full-time technical staff to answer any questions that might arise and to make fast repairs if needed. Call our national accounts staff today. We make your job easier.

ACCESSORIES

ACCESSORIES

SR3 Uninterruptible Power System

A 300-watt standby power supply providing up to 15 minutes of emergency power, as well as continuously filtered and regulated normal AC power. The SR3 has an AC current meter to prevent overloading the power supply, a battery status LED indicator, and an audible low-battery alarm.

(List Price: \$695)

Sun Research, Inc.

P.O. Box 210

New Durham, NH 03855

(603) 859-7110

CIRCLE 686 ON READER
SERVICE CARD

PMI A/B Switches

Three separate models of A/B switches featuring computer-grade PC board construction, gold or silver plated contacts, push button actuators, and low-profile brushed-aluminum enclosures.

The units allow personal computers, modems, terminals, printers, or other devices to be switched onto a common channel.

The PMI A/B Switch line includes:

- Model 220—For RS-232 serial applications.

- Model 225—Three female DB-25 connectors (switching 25 lines), allowing either RS-232 serial

or IBM PC parallel applications.

- Model 236—Three female Centronics parallel connectors (switching 36 lines), for Centronics parallel switching applications. (List Price: Model 220, \$99.95; Model 225, \$129.95; Model 236, \$149.95.)

Peripheral Marketing Inc.
16-6 Passaic Ave.
Fairfield, NJ 07006
(201) 227-8411

CIRCLE 687 ON READER
SERVICE CARD

Computer Dust Covers

A line of personal computer covers made of natural canvas with brown binding. Covers are available for individual components,

as well as for monitor/CPU and similar combinations.

Custom monogramming and embroidery is available by special order. (List Price: Monitor/CPU cover, \$16)
CompuTogs
P.O. Box 2493
Naperville, IL 60566
(312) 961-2958

CIRCLE 688 ON READER
SERVICE CARD

Choice Data Switches

A line of A-B and A-B-C switches for connecting multiple peripherals to a single port. Different models are available for parallel and serial lines. The serial version switches all 24 lines of the RS-232 interface. An economy model is also offered that switch-

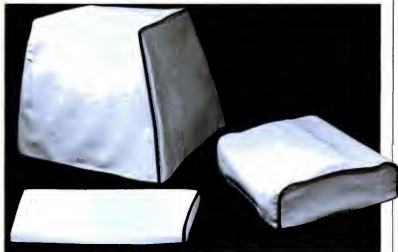
es eight of the most commonly used RS-232 signals.

Other models offered include Centronics parallel interface, RS-449 interface, IEEE-488 interface, and a special version for use in switching printers for a single IBM PC. (List Price: \$99 and up)
Computer Datacom, Inc.
1821 McGaw Ave.
Irvine, CA 92714
(714) 474-1166

CIRCLE 689 ON READER
SERVICE CARD

PC-SAFE

A lockable cabinet of heavy-gauge steel enclosing the systems unit and keyboard, with bolt-through mounts for the IBM monitor. PC-SAFE can be secured to any sur-



Computer Dust Covers, CompuTogs

face and features a flip-up front cover for access to the keyboard compartment.

Multiple units can be ordered with locks that use either identical or individual keys. The eight-tumbler lock uses key blanks not available from locksmiths, offering an additional measure of security.

(List Price: \$185)

Omni Tech Corp.

1455 N. Barker Rd.

Brookfield, WI 53005

(414) 784-4178

CIRCLE 690 ON READER
SERVICE CARD

Global CRT Shuttle

An adjustable, two-component PC stand that allows as many as four persons to share a single PC system. The Global CRT Shuttle consists of a steel CPU floor stand and an adjustable "arm" capable of supporting a CRT weighing up to 120 pounds.

The PC Shuttle arm can be ordered with either a dual-knob "C" clamp for mounting onto a desk edge or a flat mounting plate. The monitor's power and data cable cords are supported with fully shielded connectors.

(List Price: \$299)

Global Computer Supplies

45P S. Service Rd.

Plainview, NY 11803

(800) 8-GLOBAL

(516) 292-3400

CIRCLE 694 ON READER
SERVICE CARD

PUBLICATIONS

GKS Primer

A guide to the Graphical Kernel System (GKS) providing an overview of computer graphics concepts and an explanation of why GKS and other standards are necessary. Chapters are devoted to specific GKS procedures and syntax for graphics development, including an extensive list of subroutines. The author,

Lucia McKay, uses the idea of a universal language to describe GKS, a process by which various bits of information are received and translated into one language and then returned to real-world specifics. Also included is a glossary of computer graphics terms.

(Cover Price: \$9.95)

Nova Graphics

International Corp.

1015 Bee Cave Woods

Austin, TX 78746

(512) 327-9300

CIRCLE 691 ON READER
SERVICE CARD

PKI's Directory

A printed reference to 605 business, financial, and economic on-line database services. The directory contains a detailed description of each database, listing its contents, updates, data origins, access service, fees, and so forth. The data-

bases are arranged by major subject headings.

A quarterly updating service is available to purchasers of PKI's Directory, which also produces an end-of-year cumulative index.

(Annual Subscription: \$128)

PKI, Inc.

641 Lexington Ave.

New York, NY 10022

(212) 688-5112

TWX: 650-218-4179

CIRCLE 692 ON READER
SERVICE CARD

SERVICES

Computer Resource Center

A 24-hour, on-line database listing computer-related items for sale,

computer services, and technical consultants.

The service is free to callers, since there are no connect charges or initial/monthly fees. Also available from the service is a Technical Personnel Directory, listing qualified individuals for technical employment.

To use the service, the caller must have a 300- or 1,200-bps Bell 103 or 212A modem, set at 1 stop bit, odd or no parity, and 8 data bits.

Unicomp Corp.

Info: (206) 223-6453

Modems:

(800) 862-6206;

(206) 223-0694

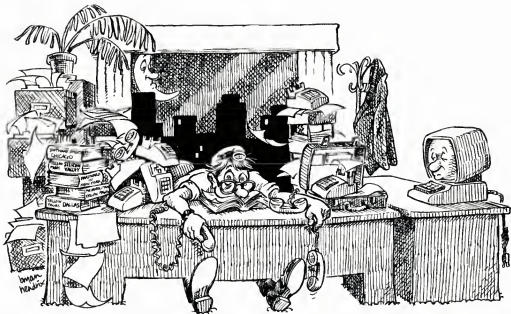
CIRCLE 693 ON READER
SERVICE CARD

New on the Market Submission Guidelines

1. Please include the retail price, distribution methods, and details of both hardware and software requirements needed for an end-user to properly use your new product. For software especially, this includes required amount of RAM, number and type of disk drives, operating system(s) supported, and any peripheral equipment needed.
2. Releases should be typewritten double-spaced on one side of the paper. Copies of advertisements for the product may be included, but in most instances we need more information about a product than is typically included in an ad.
3. Include telephone contacts for marketing and technical questions.
4. If available, include black-and-white glossy photos of the product, 4 x 5 in. or larger.

Please note that all products are run on a space-available basis. It is impossible to guarantee publication of a product announcement for any particular issue.

Inclusion in **New on the Market** is at the exclusive discretion of the editor.



Spending more time searching for the technology...than using it?

DATA SOURCES systematically organizes all your DP options!

No other resource puts over 20,000 systems and applications software packages...over 17,000 hardware and data communications products...and some 9,000 company profiles instantly at your fingertips.

DATA SOURCES is conveniently indexed to help you locate the products you seek quickly...find others you may not be aware of...and determine their capability and compatibility at a glance. You'll use...

...The Product Index, with its complete listing of every product covered by DATA SOURCES, to lead you to the larger listing quickly.

...The Company Profile Index, to help you identify all the product

areas in which a firm is currently involved easily.

...The Company/Product Index, to find each vendor's full range of products within each equipment category instantly.

...The Software Index, to help you access specific packages, even if you're not sure of the author or product classification.

And DATA SOURCES' handy comparison charts let you review similar products by multiple manufacturers for key criteria, including compatibility and price.

PLUS...in-between quarterly editions, subscribers have access to the exclusive DATA SOURCES HOTLINE for information on product location assistance.

JUST CALL (800) 227-1617 ext 251 TODAY! (In California, call (800) 722-3543 ext. 251)

We'll send your first 2-volume edition on a 30-DAY APPROVAL basis and enter your year's subscription to DATA SOURCES at just \$170...\$60 off the regular cover price...FOR 4 quarterly editions.



DATA SOURCES

Leading the Industry in Information Management

P.O. Box 5845, Cherry Hill, N.J. 08034

TS05

Save up to 38% on PC Magazine!

Yes! I want to start receiving PC,
the Independent Guide to IBM Personal
Computers every two weeks. Send me:

- ☐ 24 issues for \$21.97. Includes 4 bonus issues!
☐ 48 issues for \$39.97. Includes 8 bonus issues!

Savings based on full one-year subscription price of \$34.97

CHECK ONE:

- ☐ Payment enclosed ☐ Bill me later

MR./MRS./MS. _____ PC 45739
(please print full name)

COMPANY _____

ADDRESS _____
☐ business ☐ home

CITY _____

STATE _____ ZIP _____

Add \$48 a year in Canada and all other foreign countries.
Please allow 30 to 60 days for delivery of first issue.

Save up to 38% on PC Magazine!

Yes! I want to start receiving PC,
the Independent Guide to IBM Personal
Computers every two weeks. Send me:

- ☐ 24 issues for \$21.97. Includes 4 bonus issues!
☐ 48 issues for \$39.97. Includes 8 bonus issues!

Savings based on full one-year subscription price of \$34.97

CHECK ONE:

- ☐ Payment enclosed ☐ Bill me later

MR./MRS./MS. _____ PC 45739
(please print full name)

COMPANY _____

ADDRESS _____
☐ business ☐ home

CITY _____

STATE _____ ZIP _____

Add \$48 a year in Canada and all other foreign countries.
Please allow 30 to 60 days for delivery of first issue.

Save up to 38% on PC Magazine!

Yes! I want to start receiving PC,
the Independent Guide to IBM Personal
Computers every two weeks. Send me:

- ☐ 24 issues for \$21.97. Includes 4 bonus issues!
☐ 48 issues for \$39.97. Includes 8 bonus issues!

Savings based on full one-year subscription price of \$34.97

CHECK ONE:

- ☐ Payment enclosed ☐ Bill me later

MR./MRS./MS. _____ PC 45739
(please print full name)

COMPANY _____

ADDRESS _____
☐ business ☐ home

CITY _____

STATE _____ ZIP _____

Add \$48 a year in Canada and all other foreign countries.
Please allow 30 to 60 days for delivery of first issue.

Save up to 38% on PC Magazine!

Yes! I want to start receiving PC,
the Independent Guide to IBM Personal
Computers every two weeks. Send me:

- ☐ 24 issues for \$21.97. Includes 4 bonus issues!
☐ 48 issues for \$39.97. Includes 8 bonus issues!

Savings based on full one-year subscription price of \$34.97

CHECK ONE:

- ☐ Payment enclosed ☐ Bill me later

MR./MRS./MS. _____ PC 45739
(please print full name)

COMPANY _____

ADDRESS _____
☐ business ☐ home

CITY _____

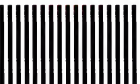
STATE _____ ZIP _____

Add \$48 a year in Canada and all other foreign countries.
Please allow 30 to 60 days for delivery of first issue.

**BUSINESS REPLY CARD**

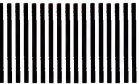
FIRST CLASS PERMIT NO. 66 BOULDER, COLORADO

POSTAGE WILL BE PAID BY ADDRESSEE

P.O. Box 2443
Boulder, Colorado
80321NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES**BUSINESS REPLY CARD**

FIRST CLASS PERMIT NO. 66 BOULDER, COLORADO

POSTAGE WILL BE PAID BY ADDRESSEE

P.O. Box 2443
Boulder, Colorado
80321NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES**BUSINESS REPLY CARD**

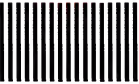
FIRST CLASS PERMIT NO. 66 BOULDER, COLORADO

POSTAGE WILL BE PAID BY ADDRESSEE

P.O. Box 2443
Boulder, Colorado
80321NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES**BUSINESS REPLY CARD**

FIRST CLASS PERMIT NO. 66 BOULDER, COLORADO

POSTAGE WILL BE PAID BY ADDRESSEE

P.O. Box 2443
Boulder, Colorado
80321NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

PC BlueBook

Rates and Information

PC: BlueBook is a high-response, low-cost source for advertising in the fastest growing computer market in the world. Advertisers choose between set categories and may include a logo. Display advertisers may cross-reference to their current display ad.

Circulation: 250,000 Paid Circulation Rate Base.
Readership: 750,000 Est.

AD STYLE

1 line Heading (25 characters maximum). 7 lines Body Copy (45 characters per line). 4 lines for Company name, address and telephone.

RATES

Per Issue: \$200. Additional Lines: \$20 per line. Logos: \$125 per issue. Minimum Order: 4 times within 6 issues period. Terms: Prepayment is required. Check, money order, American Express, Diners, VISA or MasterCard are accepted.

DEADLINES

March 7th for the May 14th issue, on sale April 23rd. Send your ad and prepayment to: PC BlueBook, Classified Advertising, 12th Floor, One Park Avenue, New York, NY 10016. Advertising sales: (212) 503-5115. Customer service: (212) 503-4506

ACCESSORIES SUPPLIES

IBM STYLE BINDERS, SLIPS

Complete program packaging line. D-ring cloth binders, slip cases, floppy pages, game portfolios. Continuous paper with three large holes, 20 lb. to go in binders. Blank disk envelopes. Function key cards tell user your F1-F10 meanings. Low prices on floppy disks. Call, write for prices. Catalog. Fast service, low prices.
ANTHROPOMORPHIC SYSTEMS LIMITED
376 E. St Charles Road
Lombard, IL 60148
(312) 629-5160

OUR EVERYDAY PRICES

64K RAM sets (set of 3)	\$35.00
5 1/4" Dysan OSDD disk	\$29.90/Box
(Special box contains 11 Dysan disks)	
Call for quantity discounts	
WGGB	
316 N. Owen Street	
Mount Prospect, IL 60056	
(312) 392-2821	

TPS OFFERS IBM BRAND SUPPLIES

The discriminating buyer will appreciate the convenience of buying IBM products through TPS at a price that justifies the purchase of this quality brand. 24 hour fulfillment on typewriter. Word/data processing supplies a complete line of other OEM and generic products are also available.
TPS TOTAL PRODUCT SUPPLIES
15000 Charlevoix
Grosse Pointe Park, MI 48230
1-800-822-9150 or (313) 882-9150 within Mich

KEYTOPS/KEY OVERLAYS

Touchdown™ full-size keytops enlarge major control keys on IBM and most compatibles: state model and color: black or IBM grey \$21.95. Touchdown™ key overlays available for 5251, 5620, Displaywriter 2, Wordstar, Lotus 1-2-3 and most popular software, plus do-it-yourself kits.
\$6.95-\$29.95 US orders postpaid
HOOLEON CO. DEPT. 88
P.O. Box 201
Cornville, AZ 86325
(602) 634-7517

BUSINESS OPPORTUNITIES

PACKAGE YOUR SOFTWARE

IBM Value-Added Dealer for PC, XT, AT seeks mutually beneficial business relationship with vertical market software development firms. Increase sales and profitability by selling your software and IBM hardware as a system. The Pre-Loaded and tested package can be drop-shipped to customers. Other sales and marketing services available. Reply to:
P.O. Box 612
San Mateo, CA 94401

VIDEO MANAGER PROGRAM

Distributors and dealers wanted for the best video store management program now available with the most features. Full range of membership and title features and reports with G/L and A/R. Fast rental and reservation tracking. Introductory price \$1,000; retail. Demo w/manual \$50.00.
Top File Management, Inc.
RD#1, Box 114
Fitchtown, NJ 08825
(201) 996-2176

COMPUTER REPAIRS

IBM PC/XT/PPC REPAIR

Circuit boards and electronic sub-assemblies professionally repaired on ATE (Automatic Test Equipment). An alternate solution, with lower pricing and fast turnaround. Dealer & Maintainer packages available. From keyboard to power supplies. Call.
LUNTRACE INCORPORATED
3350 Scott Blvd, Bldg. 20
Santa Clara, CA 95054
Area 408 727-7573

IBM & COMPAQ REPAIRS

For years, Computer Systems Repair (CSR) has specialized in IBM PC, XT, and Compaq (corporate) computer repairs. Our "state of the art" automated test equipment makes CSR the leading third party repair in the industry. Best of all, CSR offers quality repairs, 3-day turnaround time and a 9 month warranty, all at a low cost.
COMPUTER SYSTEMS REPAIR (CSR)
Meadowlands Corp. Ctr., 205 Chubb Ave.
Lynchburg, NJ 07071
(201) 460-1160

COMPUTER TRAINING

MICROREF™

QUICK REFERENCE GUIDES
GIVES YOU COMPLETE SOFTWARE COMMANDS AND PROCEDURES IN SECONDS! Thumb-indexed, easy-to-follow steps, built-in case, durable plastic pages, illustrations, glossary & index. MICROREF Wordstar, Multiplan, VisiCalc, SuperCalc, \$14.95 each. MICROREF Lotus 1-2-3, \$16.95. Your satisfaction is guaranteed. Order toll-free (800) 323-6043; in Illinois (800) 942-6077.



EDUCATIONAL SYSTEMS, INC.
1000 Skokie Boulevard
Winnetka, IL 60091
(312) 296-4750

COMPUTING COURSES

"Structured Programming in BASIC" for IBM and compatibles, "Microprocessing Essentials", university-level courses for individual and personal use with lectures on audio cassettes, Microtrainer 2 and Microtrainer 68K for classroom microelectronics training. Ask for brochures.
WATERLOO DISTANCE EDUCATION INC.
1051 Clinton St.
Buffalo, NY 14206
(519) 684-4340

DISKETTE COPY SERVICE

DECADE OF SERVICE 3 1/2" & 5 1/4"

Guaranteed fast turnaround for duplication and formatting on high quality OEM diskettes. Virtually all formats: Commodore, Apple, IBM PC, Kaypro, DEC, Alan, plus many more. Serialization, state of the art copy protection and custom packaging available. Personalized service is our specialty.
COMPUTER MEDIA PRODUCTS
5480 Complex St., Suite 110
San Diego, CA 92123
(619) 565-7002

BLUEBOOK

BLANK ORDER SERVICES

Diskette duplication, packaging, stocking and drop-shipping services based on your long-term needs. Place a blanket order with releases as you need them for large or small quantities at a fixed price. No extra charge for "mastering" label printing or application.
STAR-BYTE, INC.
2564 Industry Lane
Norwood, PA 19091
(610) 539-4300

9 TRACK TAPE TO DISKS

Conversion from ASCII or EBCDIC 1600 BPI magnetic tape to PC-DOS 5 1/4 diskettes. New high speed automated process verifies transfer. Quality guaranteed. Only \$65 CENTS per thousand characters. \$25 minimum. Other conversion available.
ASI INC.
1259 El Camino Suite 260
Menlo Park, CA 94025
(415) 323-6338

ALLENBACH INDUSTRIES, INC.

Allenbach created the industry, and we've since been imitated—but never duplicated. Copies supplied on OEM quality Allenbach LIFETIME GUARANTEE diskettes, now available in a variety of colors. Virtually all formats and systems. Copy protection, serialized etc., downloading and packaging available. Rapid delivery on 100 to 1,000,000 copies.



ALLENBACH INDUSTRIES, INC.

2101 Las Palmas, Suite A
Carlsbad, CA 92008
(800) 854-1515, in CA (800) 468-2627

PERFECT COPIES GUARANTEED

Why risk duplicating your important programs on your computer, when our equipment is designed solely to duplicate disks and verify their perfection. 100%+ Over 600 formats including Commodore 64 Plus serialization, copy protection, labeling, packaging, shrink-wrapping and test, personalized service.



WESTERN TRANSDATA, INC.

1701 E. Edinger Ave. A-7
Santa Ana, California 92705
(714) 547-3083 (Collect)

SOFTWARE FINISHING

DUPLICATION done by state of the art, high speed equipment for the IBM, APPLE, ATARI, TRS-80, Commodore and many more. Copy Protection, Serialization, Custom Printing, Packaging and Shrink Wrapping are also available. Your programs are duplicated on Critically Certified disks that exceed ANSI specifications. Fast turn-around guaranteed.
Omni Resources Corp.
50 Howe Ave.
Milbury, MA 01527
(617) 865-4451 (800) 343-7620

PACKAGING & FULFILLMENT

Superior diskette duplication and anti-copy protection, colored diskettes, art/graphics design, camera ready prep, assembly, shrink wrapping. IBM style inner binders/slipcases, vinyl binders, 2 pocket folders, plastic disk albums, display pads, disk pages, mailers, labels, ship cartons.
INPUT/OUTPUT MANAGEMENT
8 East Worcester St.
Worcester, MA 01604
(617) 755-0900

DISCOPYLAYS, INC.

Introducing Logguard, state-of-the-art custom copy protection developed by Discopylays engineers. Copy protection for floppy and hard disk MS-DOS. Discopylays specializes in the duplication, copy protection, downloading of all formats on 3 1/2", 5 1/4", & media. Serialization, labeling, packaging services. "Each a perfect original."
Discopylays
6800 Wyatt Drive, Suite 10M
Santa Clara, CA 95054
(408) 988-0438

IBM PROTECTION THAT WORKS

If you're producing software for IBM Personal Computers, you're probably tired of losing sales because of illegal copying. ALF's MultiGuard protection format is the answer. Call our toll-free number today for complete information on MultiGuard and our other copying services and products.

ALF PRODUCTS, INC.

1315 F. Helson St.
Denver, CO 80215
1-(800) 321-4668 (Colo. (303) 234-0871)

HARDWARE

ADD-ON BOARDS

FIXED DISK BIOS/BOOT

FIXT boots from DATAMAC, DAWING, XEBEC, PERCOM, GREAT LAKES, ZORAX, others. Adds XT-like BIOS interface for your disk to IBM PC or COMPAT. Plug-in installation. DOS 2.0/2.1 reqd. Specify controller model with order \$70 + \$3 ship. + tax. MC/VISA. (Optional volume support at additional cost.)
GOLDEN BOW SYSTEMS
PO BOX 3039
San Diego, CA 92103
(619) 258-9349

IEEE-488 INTERFACE

Halfbus IEEE-488 interface and software turns your PC, AT or compatible into an instrumentation work station for the lab, test, and measurement. We are the major OEM supplier with interfaces for 10 different architectures and the most comprehensive coverage of operating systems and languages. \$395 software \$75 NATIONAL INSTRUMENT
12109 Technology Blvd, Dept PC
Austin, Texas 78721
(800) 531-5066 or (512) 250-9119

DISCOUNT 64K RAMS

\$27.00 for set of 8
25-100 \$2.90 ea
100-250 2.80
250+ 2.70
Multifunction Board 0-352K @ \$199 Top Quality w/Full Guarantee C/D/VISA/MC/Cashiers Check—\$5 ship chg.
PC/RAMS
608 Albert Way
Petaluma, CA 94952
(707) 778-1905

DCLOCK REAL TIME CLOCK

With dClock clock/calendar, you'll never again have to enter the date and time when starting DOS. Easy to install. Does not use expansion slot. For the IBM PC, PC/XT or COMPAT. \$59.95 — \$1 shipping/handling (\$4 s/h outside U.S.). TX residents add sales tax. Check or MasterCard or VISA accepted (with number, expiration date, and signature). Mail to:
MICROSYNCH, INC.
POB 116302
Carrollton, TX 75011

HARDWARE

DISKETTES

BULK DISKS OS/DD \$1.05

SS/DD 5 1/4. In quantities of 50. All disks are 5 1/4". All disks include LIFETIME WARRANTY and come with Tyvek sleeves, reinforced hubs and write-protected tabs. Shipping \$3.00 per 50 or fewer disks. NY state res. add sales tax. Check or M.C. Call for boxed disks and hardware prices.
COMPUTER BROKERAGE INTERNATIONAL
Post Office Box 2100, Dept. PC-A03
New York, New York 10105
(718) 263-9500

HARDWARE

PERIPHERALS

BAR CODE READERS/MAGNETIC STRIPE READERS

TPS provides Bar Code and Magnetic Stripe Readers and combinations of these for simple installation on IBM PC, PCjr, DEC Rainbow, Professional VT220 series terminals, NCR Decision Mate V. Ti Professional, etc. They connect between the keyboard and the PC so that no card slot or programming is required. \$695-\$995.

TPS ELECTRONICS

4047 Transport Street
Palo Alto, CA 94303
(415) 856-6833

HARDWARE

POWER PROTECTION

SURGE SUPPRESSORS

Protectal™ surge suppressors protect your computer from voltage spikes. Two models, each with 6 outlets, monitor light, way case and 2 year warranty. Approx. 3 1/2" x 5". Components UL tested. PRO-1 plugs into wall socket, \$29.95. PRO-2 w/ master, on/off switch, 6 cord, \$49.95. Add \$2 handling OH res. + 5.5% tax. VISA/MC/CK.
FRAXION PRODUCTS, INC.
1101 Paxton Rd. Ste. 7
Cincinnati, OH 45228
(513) 321-0400

MERICK STAND-BY POWER

THE MERICK STAND-BY POWER SYSTEM provides back-up power & protection from power failures, brownouts, surges, spikes, a-v-d power line noise. The enclosed battery will keep a computer running for greater than 20 minutes during a power failure. 400 watt system-\$495; 800 watt system-\$795.

MERICK, INC. POWER SYSTEMS DIVISION

Box 288
Frisco, CO 80443
(303) 668-3251

HARDWARE

STORAGE DEVICES

SRI WINCHESTER SUBSYSTEMS

Internal 10 MB hard disk for IBM PC, WESTERN DIGITAL controller. Tested & formatted, complete kit \$1950. No change in BIOS, boot from hard disk. Simple to install like a floppy, DOS 2.0. Several installed, 1 year factory warranty. Additional 10 MB hard disk \$750. Tape back-up & removable HD systems available.
SRI DATA SYSTEMS
9 East Pleasant Avenue
Maywood, NJ 07067
(201) 684-4518

BLUEBOOK

9 TRACK TAPE CONTROLLER

Read and write 1s in 9-track magnetic tape. Gain access to the most widely used media for information exchange in the world. Use with Peritek compatible (Cyber, etc.) formatted tape drives at speeds up to 120 ips. Run with MS-DOS or PC/XT. Complete with interconnect cables and software. List \$680 - shipping.
OVERLAND DATA INC.
5644 Kearny Mesa Road, Suite A
San Diego, CA 92111
(619) 571-5555

COUPLER FOR 9 TRACK TAPE

Two models available to read and write 1s in magnetic tape with formatted 9-track drives. Runs all speeds and densities in PC, XT and AT running MS-DOS or XENIX. Data transfers up to 904,000 bytes per second! Complete with cable and software, prices start at \$980.
OVERLAND DATA INC.
5644 Kearny Mesa Rd.
San Diego, CA 92111
(619) 571-5555

MAILING LISTS

IBM MAILING LISTS

Now over 687,000 micro owners. Select by brand 194M Apple, 1294M IBM PC, 152M TRS-80, IBM Commodore and more! 9 phone verified reseller lists including 5163 stores, WPA, chain buying offices, Canadian and more! 12,500 computer companies. Lists by software brands. Printer models, schools, publications, etc. Over 75 different micro and mini lists. Call or write for FREE catalog. Include phone and type of company. iv Brecher
TARGETED MARKETING, INC.
Box 5125
Ridgewood, NJ 07451
(201) 445-7196

PUBLICATIONS

CATALOGS

PC BUYERS GUIDE

THE INDEPENDENT GUIDE TO PRODUCTS AND SERVICES FOR IBM Personal Computers. This master directory lists, describes, rates for ease of use, and tells you about the latest in software, hardware, accessories, supplies, books, services, etc. Everything for you and your IBM PC. It even includes an Index of Computer Companies for both adults and children. From the publishers of PC. An ideal gift at only \$7.95 (+\$1.55 shipping/handling) to U.S. destinations; and \$11.00 elsewhere. Residents of CA, CT, DC, FL, IL, MA, MD, NJ, and NY add applicable sales tax. Checks or MasterCard or VISA acceptable (with number, expiration date and signature). U.S. funds only. Mail to:
PC BUYERS GUIDE
Box 1514
Morristown, NJ 07960

SECURITY

NEW! LOW COST XT SECURITY

LOCK-IT-\$195.00 PC or XT (specify). Prevents BOOT-UP until user-chosen PW is entered. Special in-house hardware device, optional hard disk-ONLY boot, optional timed lock. ALSO AVAILABLE: PC RESET (XT or PC) with QUICKON (fast boot plus true reset). \$89.95. EASY installation. MC/VISA.
SECURITY MICROSYSTEMS CONSULTANTS
16 Flagg Pl., Suite 102
Staten Island, NY 10304
(718) 667-1019

SOFTWARE

ACCOUNTING

CUSTOM PAYROLL

All systems support multiple pay categories, calculation of all taxes, user-defined deductions, exceptional item handling, a variety of necessary reports, paychecks and W-2 forms. Written in PC Basic with full source included for easy maintenance. Prices start at \$695.00 for basic system and manual.
DATASANTH, INC.
Box 8036
Shawnee Mission, KS 66208
Phone: (913) 381-9118

SOLID ACCOUNTING PACKAGES

\$50 PER PACKAGE
• General Ledger • Payroll • Inventory • Accounts Receivable • Accounts Payable \$150 PER PACKAGE • Accountants Client Writup
These are professional, proven, packaged! Requires PC/MS-DOS 2.1 + 128K RAM. Price includes MANUAL. Telephone support available. Above prices are prepaid, shipping included. We accept cash, check or money orders.
MCBS,
12703 Steubert-Airline #202
Houston, TX 77014
(713) 563-6628

ACCOUNTANTS SOFTWARE

Finally! A software source for the practicing accountant with programs designed especially for the professional practitioner. Tax Planner, Depreciation, After-The-Fact Payroll, Form #1099 Generator, Account Analysis and Client Information System are just a few of many. Call or send for our complete catalog.
DMM SOFTWARE SYSTEMS, INC.
146 North Broad Street
Griffin, IN 46219
(219) 924-3522

BOOKKEEPING MADE EASY

Fast, Reliable, single entry checkbook accounting system in CD. Audit trail is built into normal use. Special built in safeguards to prevent errors. Allows 999 accounts with budgets, 729 departments, or charge cards, bank reconciliations, prints checks. Demo \$10 complete \$95.00 Micro-One-Write.
PERMAR & ASSOC.-DEPT. PCM
1125 Sunnyhills Rd.
Oakland, CA 94610
(800) 443-0100 ext. 644

PRACTICING ACCOUNTANTS

Ten of the top 12 CPA firms use Accountants Microsystems, Inc. Software for Professionals. DATAWRITE™ client write-up allows custom reports, packs maintenance power onto your micro. Expand your practice with Fund Asset Management, Post Facto Payroll, Practice Management and the TAX MACHINE™. Nationwide Training/Support



ACCOUNTANTS MICROSYSTEMS, INC.
3633-136th Place SE
Bellevue, WA 98006
(800) 426-8291, (206) 643-2050

PC-FUND

PC-FUND is a fund accounting system for local govts, schools, colleges, and not-for-profit groups. The system includes: General Ledger, Report Writer, PC/Encumbrance, payables, receivables, payroll/personnel, budgeting, utility billing and food assets. The system supports up to 99 funds, 9999 departments and up to 36 fiscal periods are on line. PC-FUND runs on the IBM-PC and most MS-DOS & XENIX computers.
AFMPCAN FUNDING, INC.
PO Box 77028
Sawtooth Springs, Colorado 80477
(303) 879-5770

SOFTWARE

BUSINESS

TIME ACCOUNTING & BILLING

TABS is designed for use by professionals who bill on the basis of time (attorneys, accountants, etc.). User-friendly data entry and menu-driven program selection makes TABS easy to understand and operate. STB's full-feature software is currently in use by over 1,000 firms nationwide. For details contact:



SOFTWARE TECHNOLOGY, INC.
630 N. 46th, Suite 120
Lincoln, NE 68504
(402) 466-1997

INVOICER + PLUS

Menu-driven billing & accounts receivable management system. Produces Invoices, Aged Statements, Invoice Journals, Receipts, Journals, Aged Customer Account Status, Packing lists, etc. Available with modifiable source code for dBASE II users or as a stand-alone package. (no source code) \$199. Each VISA/MC.
DATAMAR SYSTEMS
819 Gage St.
San Diego, CA 92106
(619) 223-0444

CALENDAR—SAVES TIME

FAST, graphic, effective time management. View year, month, week or day. Edit, copy, insert, delete, search and print time related information. Maintain multiple calendars on a single diskette. State/Insect commands Help. Requires PC-DOS 2.0, 128K, Mono or color. Send \$85 (check or M.O.) for "9Calendar".
iGentry Enterprises Inc.
Dept. MA1
PO Box 180760
Austin, TX 78718

PC ACCOUNTING SYSTEM

Professional Accounting for small business or home use. No codes to forget! all lookups are alphabetic. Shows effect of each entry on the screen in English. Supports 20 business units 1000 account codes, and 10,000 customers or vendors. Reports by business or consolidated in detail/summarized on screen (printer Color/mono dual floppy/hard disk \$99.95 (VISA/MC/Check/COD/MC) NYS add 7% tax.
PEGASUS SYSTEMS INC., Dept P
30 Harbour Pointe
Burlington, VT 05402
(716) 852-2699

Datamar "JOB COSTING"

Menu driven system monitors cashFlow and all job transactions. Provides multi-level burden rates & labor/material prices. Tracks change orders. Reports job status, labor distribution, etc. Interfaces with most popular accounting packages. PC/DOS, VISA/MC \$395.00
DATAMAR Systems
5055 A North Harbor Drive
San Diego, CA 92106
(619) 223-3344

MACRO-TRACK

EARLY WARNING ECONOMIC FORECASTING

Totally new for managers. Fast, easy, automatic forecasts of the entire economy, quarter by quarter, 3 years in advance. Designed for detecting next major turning points. Self contained 20 year database of most used business indicators. Unique algorithm outperforms all other forecasting methods. \$224.95 Demo Disk \$10.00.

BLACK RIVER SOFTWARE
118 N. Marshall Street, Suite 150
Winston-Salem, NC 27101
(919) 924-6389

THE DESK ORGANIZER-\$145!

Lowest price ever! While inventory lasts. The critically acclaimed program from Warner Software. Performs important desk management functions even while you are in other software. Runs alongside best selling software. Special offer includes future enhancements, tutorial disk, quarterly newsletter, 30-day guarantee, \$145 or request free information. Visa/MC/accepted. HI TECH.
Box 803-BL
Menlo Falls, NJ 53051
(414) 274-6229

BLUEBOOK

MYTE MYKE™ BUSINESS SYSTEM

Commercial grade, integrated business application software. Order Entry, Inventory Control, Sales Analysis, Accounts Receivable, Accounts Payable, General Ledger, Purchase Orders, Price-Time—time and billing. Supports single, multi-user and networked microcomputers operating under MSDOS, PC DOS, CP/M, UNIX, and others. Installation and support available.



M & D SYSTEMS, INC.
3865 North Buffalo Rd./P.O. Box 108
Orchard Park, NY 14127 (716) 662-6611

LP88-LINEAR PROGRAMMING

A powerful menu-driven system for solving linear programs with up to 255 constraints and 2255 variables. A new product-form version accepts problems up to 510K2510. Features include interactive and batch operation, spreadsheet-style input and editing, a storage system for problems and bases, sequential file input/output. Simplex algorithm restart, a complete report generator, sensitivity analysis. Requires 192K, \$99 with 8087 support, user's guide.

VISA/MC
EASTERN SYSTEMS SUPPORT, INC.
POB 15328
Alexandria, VA 22309
(703) 549-5469

ANALYTIC DECISION MODELS

OSM is an integrative modeling system supporting multiple regression, linear/integer + quadratic programming, EOQ inventory, queuing & break even modeling (all simulation based); time series, PERT/CPM Sensitivity analysis, data management, page forward/backward and other features. \$395. Demo diskette \$15.
DECISION SYSTEMS SUPPORT, INC.
31871 Via Puntiero
San Juan Capistrano, CA 92675
(714) 493-3639

CALENDAR PLUS

A time management system that displays activities in block calendar, prints calendar for selected range of activities, times, personnel or locations, print calendar extracts in tabular lists; merges separately maintained calendars. Much more. PC-DOS, MS-DOS versions. 192K, any month. Price \$155.00.

INTERNATIONAL SOFTWARE SOLUTIONS
3335 Levee Road, Suite 750
Alpharetta, GA 30202
(404) 233-1519

CONSTRUCTION SYSTEM

The Software Shop Construction System is designed for the construction industry professional. Five fully integrated applications—JC, GL, PY, AP and AR run on the IBM PC-XT and the new, more powerful AT. Package also includes audio training, computer graphics slideshow, and a manual for each application.

SOFTWARE SHOP SYSTEMS
960 Holmdel Road
Holmdel, NJ 07733
(1800) 554-9865

SALES MANAGER™

THE SALES MANAGER is a professional management tool designed to control the sales environment. The system is complete and handles Customers, Prospects, Sales Reps, Planning, Forecasting, Expenses, Form Letters, Reporting, Performance Monitors, and Call Reports. Powerful, fully supported. Price \$575.
MARKET POWER, INC.
11780 Rough & Ready Road
Rough & Ready, CA 95875
(916) 432-1200

HardRunner™

Run Lotus without system diskette! This is the authentic HardRunner™ program that allows you to run Lotus and Symphony from your hard disk without the need for a system floppy in the A-drive. \$34.95 plus \$5.50. Call toll free 24 hr. For further information see advertiser index listing for Nostradamus.

NOSTRADAMUS
5325 South 900 East
Salt Lake City, UT 84121
(1-800) 453-5433

MENU SYSTEM FOR XT/AT

Unlimited number of user defined menus. Single keyboard choices. Written in C. Fast. Screen saver function. Color or B/W. Menus changed with your word processor. Detailed manual shows easy & complicated tasks. Last price is \$39.95. 30% discount available. Requires DOS 2.X, 64K, 1 disk drive. MC/VISA.
COTTAGE INDUSTRIES INC.
POB 178, 407 Gordon
Liberty, MS 38958
(616) 792-1552

BLP88-BOUNDED VARIABLES LP

A GENERAL-PURPOSE linear programming system designed for problems in which many of the variables have simple upper and/or lower bounds. Problems with up to 255 constraints (excluding bounds) and 1255 variables are solved in a way that avoids adding the bounds to the constraint set. Menu-driven with features similar to LP88. Requires 192K, \$99 with 8087 support, user's guide. VISA/MC.
EASTERN SYSTEMS SUPPORT, INC.
POB 15328
Alexandria, VA 22309
(703) 549-5469

SOFTWARE

BUSINESS OPPORTUNITIES

WRITERS-AUTHORS

Want to write your own microcomputer book? We're looking for writers who want to make money for their hobby. Be published by one of the largest, oldest microcomputer book publishers. Obtain your computer needs list or send your own idea by writing to our editorial dept.
BIB BOOKS, INC.
Blue Ridge Summit, PA 17214
(717) 794-2191

SOFTWARE

BUSINESS PROJECT MANAGEMENT

MicroGANTT

Control your project! You describe the work, MicroGANTT calculates the schedule and budget. Time management, resource allocation, project tracking, personnel billing and load capabilities. Flexible critical path charts. Unlimited size and scope. PC-DOS, MS-DOS, CP/M-80. Free brochure. Demo available.
EARTH DATA CORPORATION
POB 13168
Richmond, VA 23225
(804) 231-0300

PRIMAVERA PROJECT PLANNER™

... the most project management you can get from a micro. Plan and schedule networks of up to 10,000 activities. Level resource use. Control schedule, resources and cost. Call or write to find out why Primavera is used by managers worldwide for improved project performance.
Primavera Systems, Inc.
Two Bala Plaza Suite 925
Bala Cynwyd, PA 19004
(215) 667-8600 Telex (910) 997-0487

THE AHA! EXPERIENCE

PMS-1, Primavera. Harvard Project Management and Perimeter Scheduling Systems. For managing any complex project: R&D, construction, business planning. 2,000-10,000 events on critical path, bar charts, resource management capacity planning & load leveling. Training also. Prof. profits on the critical path with Aha! The Project Management Software Specialists.
Aha! Inc.
109 S. River St., P.O. Box 8405
Santa Cruz, CA 95061-8405
(408) 459-9119

VIDEO MANAGER

VIDEO STORES

The best video store management program is now available with most features. Full range of membership and title features and report with G/L and A/R. Fast rental and reservation tracking. Introductory price \$1,000. Demo w/manual \$50. Dealer inquiries invited.
TOP FILE MANAGEMENT, INC.
RD #1, Box 114
Frenchtown, NJ 08825
(201) 996-2176

SOFTWARE

COMMUNICATIONS

TELEX LINK SOFTWARE

Link your computer to telex service via ITT, RCA or Western Union with Cawthon's telex software. Designed specifically for telex communications, Cawthon software is easy to use, has on-line help, self-test diagnostics, frequently called numbers, and an excellent User's Guide. Cawthon Software is available for many computers and operating systems.



Cawthon Scientific Group

CAWTHON SCIENTIFIC GROUP
24224 Michigan Avenue
Dearborn, Michigan 48124
(313) 565-4000 Telex: (610) 221-1265

THE POSTMAN

Electronic mail software designed to incorporate most word processors. Menu driven, THE POSTMAN automatically sends and receives E-Mail and Telexes. Includes an address book, message tracking, mailbox access, auto logging, simple to use. Transfers binary files (X-modem). Supports MCI Mail, EasyLink, and a service TBA 129K, \$499.
CAPCOMM SOFTWARE, INC.
26 Journal Square, Suite 1003
Jersey City, NJ 07306
(201) 795-1500

SOFTWARE COMPILER

DeSmet C-5100

Full K & R C Compiler, assembler, linker, librarian, full-screen editor and example software. Both 8087 and floating point libraries. Rated 1st or 2nd in 8/83 BYTE Benchmarks. Newsletter. No royalties on generated code. Unlimited updates \$20/each. PC/MS DOS and CP/M-85, \$109. Now available with source level debugger. Price \$159.
C-WARE
1897 New Brunswick Ave
Sunnyvale CA 94087
(408) 736-6905

BLUEBOOK

FOREIGN LANGUAGE TUTOR

POLYGLOT is a tutor for language study. It allows the input and maintenance of word and phrase lists including accents and synonyms. It allows typewritten, visual and audio quizzes. Designed for beginning to advanced language study. POLYGLOT manual and disk for PC or 3.119.95 (+ CA tax). Order from:
ALCHEMY SOFTWARE
Box 1057
Aptos, CA 95021
(408) 688-6252

SOFTWARE ENGINEERING

TECHNICAL SOFTWARE

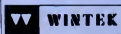
Largest selection of engineering software—CAD, Heat & Mass Flow, structural, Statistical Analysis and much more. Microcomputer programs for Mechanical, Chemical, Civil, Electrical Engineers, Architects, Scientists, Contractors. Send for detailed catalog—include \$2.00 for postage and handling.
TECHNICAL SOFTWARE INC.
3981 Lancaster Rd., #101
Cleveland, OH 44121

STRUCTURAL DESIGN

Quick, versatile, interactive structural programs—beams, columns & frames of any material efficiently analyzed & designed. Extremely friendly input & output with optional COLOR graphics. Specify PC configuration and send \$25 for demonstration disk to:
cib2—software design
763 27th Avenue
San Francisco, CA 94121
(415) 751-1337

smARTWORK™

Printed-circuit artwork editor for double-sided boards up to 10" by 16" runs on an IBM PC. Color display allows complete interactive control over the placement and routing process. ZX artwork can be made on a dot-matrix printer or pen-and-ink plotter. \$895. Write or call for a brochure.



WINTek Corporation
1801 South Street
Lafayette, IL 47904-2993
(317) 742-8428

ENG/SCI GRAPHICS

OMNIPLOT(S) (screen graphics) & OMNIPLOT (P) (plotter drivers) provide integrated engineering software 2-D & 3-D graphics with NO PROGRAMMING REQUIRED! Menu-driven, flexible professional choice of formats, tabular/in-line contour bar, pie, 3-D wire frame & much more. OMNIPLOT(S) \$135, OMNIPLOT(P) \$135. Both \$240.
MICROCOMPATIBLES
301 Prelude Drive
Silver Spring, MD 20901
(301) 583-0683

SIMULATION

GPSS-PC is a full-power version of GPSS, the most popular mainframe simulation language. More than just a language, it is a simulation environment specifically designed for interactive use on today's high-speed microprocessors. Using GPSS-PC, you can predict effects of changes to real-world systems. \$900.
MINUTEMAN SOFTWARE
P.O. Box 17118, Slow, MA 01775
1-800-343-0664 ext. 4800 (U.S.),
1-800-322-1238 ext. 4800 (Mass. only)

ENGINEERING MATH PACK

1,600+ is a menu-driven series of BASIC programs for general engineering use, including curve fitting, equation solvers and roots, sorting, probability calculations and units conversion for lists. All are interactive and testable. \$65, manual included. Also ask about our interactive finite difference thermal analysis program 1/TAS. Free brochures.
RIF WARNER ASSOCIATES
3838 Garrison Street, Suite 300
Torrance, CA 90503
(213) 540-6299

RESIDENCE HEAT/COOL CALC

Perfect for sizing heating/cooling equipment. Store weather & job data for future use. ASHRAE residential methodology & approved for use in meeting code, sizing requirements of Title 24 & other codes. Results in 6 seconds to screen or printer. Requires PC DOS, 128K. Check or MD \$375.
SOLARCY INC.
22026 Ventura Blvd., Suite 207
Woodland Hills, CA 91364
(818) 347-6396

MEGA MATH

A library of over 40 assembly language subroutines for fast numeric calculations on IBM PC, XT/AT and compatibles. Includes matrix and vector routines, Fast Fourier Transform, convolution, solution of linear equations, scalar and transcendental operations. Use with Fortran, C, and Pascal compilers.
MICRAV ELECTRONICS LTD.
Box 1, 4001A-19th St. NE
Calgary, Alberta, Canada T2E-6X8
(403) 250-1437

SOFTWARE FINANCIAL

CASH FLOW MANAGEMENT

LOOK takes all the what-if power of LOTUS 1-2-3 and allows the executive to solve problems without programming his computer. It is menu driven and generates common-sized financial statements, ratios, cash flow, trend reports and graphs. Tactical and strategic planning is the focus of LOOK. Dollar and or percentage variables are changed to generate proformas for 5 years or 12 months. \$950.
BAKER HILL & COMPANY
9085 E. Mineral Circle, Suite 210
Englewood, CO 80112
(303) 799-0238

FAMILY FINANCIAL PLANNER

PROPLANR is a LOTUS 1-2-3 (TM) based, menu driven tax, budget and savings forecasting template. PROPLANR produces 3 year monthly and 10 year annual income/tax and expenditure/savings reports. 401-K/Savings Plan analyses and graphs. Needs 512K. Send \$105 (template, \$45 demo) or \$3 (manual) to:
ALLENCRIST TECHNOLOGIES, INC.
308 Birchwood Avenue
Edison, NJ 08837
(201) 549-0125

MDRG12™ FOR MORTGAGES

A menu driven program for fixed rate tiered amortization schedules for weekly, biweekly and monthly payments for both American and Canadian Custom Headers Interest Factors. Payment factor tables. Non blended monthly schedules. Prints data: 128K RAM PC-DOS 11.3.0, \$95.00 M/C accepted.
OFFERTON PRODUCTS LTD. (EST. 1973)
1007 EARL CRESENT
BURLINGTON ONTARIO, CANADA L7T-3R1
(416) 639-0387

SOFTWARE GAMES

ZORK! MAPS & HINT BOOKS

MASTER THE WORLDS OF ZORK 1, 2, & 3, STARDROSS, ENCHANTER, WITNESS, SUNDRENDED, PLANETALL, INFODEL, DEADLINE, SURCERER or ADVENTURE with our Multi-level and Encoded maps and hints. \$7.50 ea. or 3 for \$21 (check, M/C or Visa M/C + \$ Exp. Daily). Designed BY players FOR players. Accurate. Humorous. FAST delivery!
BROKEN TIMBER PRESS, Dept. P
Box 2861
Shawnee Mission, KS 66201
(913) 722-2464 Evenings Sun - Thurs

SOFTWARE GAMES EDUCATIONAL

DEFINITION MANIA

A simple but effective & challenging multiple-choice word game aimed at an adult audience but helpful for high schoolers. Features: color sound, quiz score, playing options, 600 word dictionary, (Arner or Can.), documentation. Any PC, DOS, BASIC, 1 drive. An excellent gift idea. \$39.95. Enterlearning! U.S. Inquiries:
FACILEWARE
61 Fourwinds Rd.
London, Ont., Canada N6K-3L1
(519) 473-5812

SOFTWARE GENERAL

DVDRAK KEYBOARD SOFTWARE

Want a Dvorak Keyboard for your IBM PC? Sure. Stroke translates keystrokes, gives you Dvorak Typing Coach transfer letters for key locks, manual, self-motivation audio cassette. Works with Lotus, dBase, WordStar, etc. Stop typing and pecking—Stroke the Dvorak today! \$95.00 plus \$4.00 shipping. Visa/MC/AMEX or check.
SEASONED SYSTEMS, INC.
Box 3720
Chapel Hill, NC 27515
(800) 334-5531 (919) 967-5818

RENT PUBLIC DOMAIN SOFT/W

Rent our PC Disk Libraries for 7 days and copy them yourself! Hundreds of useful business, games and utilities FREE FOR THE TAPPING! IBM PC SIG Volumes 1-200 \$200.00
IBM PC "BLUE" 1-59 \$65.00
Remain for 7 days after receipt 3 days grace to return. Most credit cards accepted.
NATIONAL PUBLIC DOMAIN
SOFTWARE CENTER
1533 Avondale Drive
Visa, CA 92083
(619) 941-0925 info (619) 727-1015 24 hr orders

CHURCH ADMINISTRATION

CONFUCHURCH™ Unparalleled excellence for All Low Cost! Supports Software For ALL of Your Church Admin: Congregation Mgt., Contribution Mgt., Ledger & Word Processing. Available For Most Micros—including IBM PC, DEC Rainbow, Radio Shack III/IV, Tandy 2000, Corona, Sanyo and Zenith. Hardware Available. Dealer Inquiries Invited.
MICROCOMPUTER TECHNOLOGY
& SOFTWARE, INC.
917 Hospital Drive—P.O. Box 596
Niceville, Florida 32578
(904) 678-3328

BLUEBOOK

THE LABEL MAKER™

Print labels with bar codes, OCR-A like and large characters from a data entered at keyboard or from disk files. Create and save unique printing formats and record layout. Print for name and record add, change, delete, sort and select on disk files. Minimum IBM PC required and Dosista 92 or 93 printer. \$395
1.1/2 SOFTWARE
P.O. Box 2044
Arlington Heights, IL 60006
(312) 364-1065

SHOP CHEAP—EAT SMART

COLORADOZEE-Save more money with your discount coupons and rebates. 64K • 0818/ANALYZER-Use those extra pounds! Tracks calories • 23 nutrients. Ideal for menu planning. 128K • Immediate shipment, 2 week money back trial. \$40.95 ea. • \$2.50 off AmEx MC Visa. Call for free brochure
NATURAL SOFTWARE LTD
7 Lake St., STE 7E
White Plains, NY 10603
(800) 626-2511 (914) 761-9229 in NY (collect)

OKIOKTA PRINTER SUPPORT

Get the most out of your OKIOKTA 92 parallel printer. For MS-DOS 2.0+ and IBM-compatible. Keys define line. Use and edit downloadable character sets. Graphics screen dump, margins around perforations, last copy of printer features, including tabbing. Check or money order for SuperKey Package. \$36 NYS add tax
DR. MILTON ROSENBERG
84-50 169 St., Box 509
Jamaica, NY 11432
(718) 657-3099

SOFTWARE GRAPHICS

35mm COMPUTER SLIDE EXPRESS converts graphic files produced on the IBM PC into vibrant 35mm color slides with color resolution 400% better than your monitor. Leave your printouts behind. Use high resolution color slides at your next presentation. **COMPUTER SLIDE EXPRESS** \$6 slide \$30 minimum order
VISUAL HORIZONS
180 Metro Park
Rochester, NY 14623
(716) 424-5330

GRAPHIC PRINTER SUPPORT

At last IBM PC graphic character support for your dot matrix printer. Use the PRSIC key. Its product quality scaled dot mode reproduces all of your display on your Epson IBM Okidata IDS, Centronics, DEC, Amstar, Datascout, Gemini, TI-850, Ritehand, Toshiba, NEC 8023 or C-10h printers. If your printer is not listed let us know and we will support it. **GRAPHPLUS** is now available for all versions of PC or MS-DOS and will operate with IBM and Hercules graphics boards, Techni- and Hercules graphics boards. Technology, Inc. \$49.95
JEWELL TECHNOLOGIES, INC.
4451-53rd Avenue Southwest
Seattle, Washington 98116
(206) 937-1081

ARTPAK™ DRAWING/ANIMATION

Create exciting & colorful animation for store displays, cartoons, educational shows & demos using ARTPAK. Make a bird fly! Or a man jump! In a complete drawing board, probably the easiest to use graphics program available. Many special effects. You can even add music! 128K • C-G card \$99. Ask about color printing. See our full page ad this issue.
PatSoftware Corporation
6100 Barnows Dr.
Los Angeles, CA 90048
(213) 259-9650

FORTRAN/PASCAL GRAPHICS

GRAFMATIX (screen graphics) 70 Microsoft FORTRAN/PASCAL (3.1, 3.2) IBM 2.0 or OR FORTRAN callable subroutines. Professional graphics power backed by a 100 pg user manual. 5 packs in one, general utility, 2-D interactive, 3-D 2-pixel support, 3-D plots, 3-D solid models (hidden line removal). \$135. H-P IBM, HP Plotter? Try PLATMATIX for complete plotter graphics capabilities. Interface w/GRAFMATIX. \$135. Both \$240.00.
MICROCOMPUTABLES
301 Prevue Drive
Silver Spring, MD 20901
(301) 593-0683

EXECUVISION™

Make your next presentation effective & memorable with EXECUVISION™ Presentation Graphics System. Pick from library of thousands of pre-rendered images, or sketch your own. Draw logos, make graphs & charts, add text with 10 fonts "cut & paste" & animate—all in 64 color combinations. For IBM PC & compatibles.

EXECUVISION

VISUAL COMMUNICATIONS NETWORK

236 Main St.
Cambridge, MA 02142
(617) 497-4000

FLOWCHARTER

EasyFlow is a computer aided flowchart generation tool. Charts up to 5 by 11 shapes in size, automatic line routing, automatic text centering within shapes, 100-page manual plus many more features that we can mention here. Runs with all printers on any MS-DOS or PC-DOS machine. \$49.95 US.
HavenTree Software, Ltd.
RR #1, Box 110
Seelye's Bay Ontario, Canada K0H-2N0
(613) 542-7270 ext. 50

PLOTTER PROGRAMS

IBM PC/IBM PCjr and APPLE computers to drive the Hewlett-Packard and compatible plotters. The DGS SIGNMAKER can create test slides with up to 100 lines-\$75. The DGS ORGANIZATION produces organization charts with space for 57 individuals-\$175. For ordering or additional information contact
DECISION GRAPHICS, INC.
P.O. Box 2776-PC
Lafayette, CA 94501
(408) 796-0341

FONT GENERATOR

Quickly and easily create fonts—then download them to the printer. Any program can access the new set (at printer's fastest speed)—i.e. cyrillic, Hebrew etc. In 1985 (on 1351). Supports DSI 92 & 93, TeX-88 1351 & EPS-ON LD-1500. FONTGEN runs on IBM & most compatibles with mono or graphics screen. Ready fonts avail.
HAC, INC.
216 Whalen St.
Brooklyn, NY 10471
(212) 796-4534

SOFTWARE HEALTH

CompoMedic™

PROVEN Practice Management System in use 4 yrs. Patient data management, AR statements, insurance forms, practice analysis, word processing, recall, delinquent tracking, historical data. FLEXIBLE User designed forms: reports \$3600. Training XT/AT Dental (DentalWare™), eyecare (Optometry EyeMate™), and veterinary (Vetlog™) also available. Dealer inquiries directed.
DATA STRATEGIES, INC.
332 S. Juniper St. Suite 210
Escondido, CA 92025
(619) 488-9218

SOFTWARE HOBBIES

ASTROLOGY SOFTWARE

We have everything from high-accuracy calculation packages for professional astrologers to programs that print multi-page natal, forecast, relationship and numerology interpretations for everyone. These interpretation programs include a keyboard to tell the copyrighted text output. ACS SOFTWARE
BOX 26, Dept. C
Orleans, MA 02653
(617) 255-0510

THE GARDENER'S ASSISTANT

Have your IBM PC or PCjr layout your garden, and suggest plant/harvest dates and quantities to buy and plant. Select from over 50 vegetables or add your own. Garden layout is produced on your screen where you may use commands to modify the layout. Optional printer output. Gardener's may be saved to disk. IBM PC and PCjr with one disk drive \$45.00. (Also available for Apple II series and C-64).
SHANNON SOFTWARE, LTD.
P.O. Box 6126
Falls Church, VA 22046
(703) 573-9274

STAMP COLLECTORS

The Philatelic Management System is superior software for every level of collector. Covers every aspect of collection management. Inventory Module now available and upgradeable to complete system. IBM PC, Apple IIe and III. Complete system \$295. Inventory Module \$159. Demo package \$15, credited to final purchase. **SOFTSTYLE, INC.**
7192 Kalamandale Hwy., Suite 205
Honolulu, HI 96825
(808) 367-5600

SOFTWARE INFORMATION MANAGEMENT

KWIK-REF/1

A general purpose text filing system. It is designed to file and cross reference documents, notes, letters and any text materials. It can keep track of up to 32,000 key words and 32,000 documents using "and" "or" and "xor" combinations. \$250.00.
CHEN INFORMATION SYSTEMS, INC.
3150 Almaden Expressway Suite 243
San Jose, CA 95118
(408) 723-2343

SOFTWARE INSURANCE

THE AGENCY MANAGER™

Designed by insurance professionals for independent insurance agents, this integrated system performs: Customer acq., general ledger, client data update and retrieval, over 100 marketing reports and sales tools, ACCORD's Easy main menu and HELP feature. **NAVAS** IBM-PC, CP/M, TurboDOS
APPLE II SYSTEMS
Pauling Rd.
Monroe, IL 60449
(312) 534-5575

P & C INSURANCE AGENCY

Insurance agency management package. Completely interactive from invoicing to balance sheet and P&L. Full month-end and daily reports. Basic pkg. \$2000. Options available: marketing word processing, on-line customer policy profile, customer online daily transactions, producer reports & more. PC-DOS & CP/M.
DIMENSIONAL BUSINESS SYSTEMS
250 N. W. 4th Diagonal
Boca Raton, FL 33432
(305) 368-0270

BLUEBOOK

SOFTWARE LANGUAGES

FORTH-32

The most complete language available for the PC. Comprehensive 420 page manual. Complete interface to DOS and BIOS, including graphics, video interface, parallel and serial ports, light pen, joy-stick, sound, color, DOS file access. Double screen color. The only full FORTH 8086 Assembler. See our ad this issue. QUEST RESEARCH, INC. 303 Williams Ave. Huntsville, AL 35801 (800) 558-8088 or (205) 533-9405

COMPATIBLE LANGUAGES

C. Pascal and Multi-Basic compiles generate compatible object code so languages can be mixed. C to H-BASIC, Pascal to H-Jensen & Wirth - extensions and Multi-Basic compiles both BASIC and C-BASIC \$139 each. Available for PC-DOS, MS-DOS, CP/M-80, TRSDOS on Models 1, II, III, 4, 12. Send for free brochures. ALGOR SYSTEMS 1353A Preston Rd., Suite 365 Dallas, Texas 75240 (214) 494-1315

BETTER BASIC

- STRUCTURED LANGUAGE WITH BASIC SYNTAX
 - EXTENSIBLE-CREATE YOUR OWN KEYWORDS
 - MODULAR-PROCEDURES CAN BE GROUPED TOGETHER INTO LIBRARY MODULES FOR HIGHER PRODUCTIVITY
 - UTILIZES FULL PC MEMORY CAPACITY (640K)
 - FULL SUPPORT FOR GRAPHICS, COMMUNICATIONS, AND SCREEN FORMATTING \$199, 8087 MODULE \$99, RUNTIME SYSTEM \$250, SAMPLE \$10
- SUMMIT SOFTWARE TECHNOLOGY, INC. PO BOX 99 BARBON PARK WELLESLEY MA 02157 (617) 235-0729

SOFTWARE MAILING PROGRAMS

MY-T-MAILER™ \$30

Our users love this sturdy menu-driven worker. Secretaries say "Tender!" Postages, 3x5 cards, envelopes, any format. Customize labels with line-by-line printer fonts. Sort, Search & Select with powerful, flexible, easy user-interface. EZ Browser, Edit, & Delete. Print up to 5000 copies of one label. Also PCjr! Req. 128K. \$30. JOHNSON SOFTWARE COMPANY P.O. Box 16507 Orem UT 84057 Seattle, WA 98116 (206) 935-4861

SOFTWARE MANUFACTURING

MCBA MANUFACTURING SYSTEM

Adapted for the IBM PC using MS-DOS, Inventory Management, Bill of Materials, Order Processing, Purchasing, Job Costing, MRP, Labor Performance, Shop Floor Control, Standard Product, Costing and Routing, Accounting. Install & support available. In use at over 11,000 installations. MCM Systems, Inc. 24525 Southfield Rd. Suite 205 Southfield, MI 48075 (313) 557-1254

MYTE MYKE™ MANUFACTURING

CONTROL SYSTEM integrates with BUSINESS SYST & features multi-task capabilities. STD COST bill of material and operations routing profile where used, same as except & projection capabilities. FORECAST/SCHED, MRP, MPP. Production drafting, SHOP FLOOR CTRL, Install & support avail. CF/M, PC DOS, MS DOS, UNIX & more.



MOS ASSOCIATES, INC. PO Box 108 Orchard Park, NY 14127 (716) 662-6621

MFG. CONTROL SYSTEMS

A Comprehensive system for repetitive or job shop type manufacturers consisting of: 8/M Inventory, Order Processing, Purchasing, Mat. Req. Planning, MRP, MPS, Shop Floor Ctrl & CRP Cost devel., Job & W/O Costing, Accounting. 1 Yr warranty included. Train & consult avail. Compare our system & prices for best value. PRODUCTION SYSTEMS INC. 410 Mackley Ave. Santa Rosa, CA 95405 (707) 526-1294

HELMSMAN'S H-MRP SYSTEM

Modern and classic, on-line net change. MATERIAL REQUIREMENTS PLANNING Modular fast, simple, easy, flexible, and cost effective. Integrates with accounting. Runs on PC-DOS 5.0/2K, hard disk, stand-alone or networked. Includes H-800M H-BUY, H-STORE, H-MAKE, H-PLAN. HELMSMAN SYSTEMS, INC. 1030 So Winchester #205 San Jose, CA 95128 (408) 246-6300

SOFTWARE MEDICAL

POS/1™ VERSION 4.0

MEDICAL BILLING & A/R. Statements & Invoices. Aging & revenue analysis with bar graphs. Multiple doctors, practices, insurances. Day sheets, recall notices, referring physicians, audit trails, ledger details. Online update & access by acct. In-house. Customizable procedure & Cx codes, menu-driven help screens. PC-DOS, 128Kb, hard disk. \$2200. CHEN INFORMATION SYSTEMS, INC. 3150 Almaden Expressway Suite 243 San Jose, CA 95118 (408) 723-2343

THRESHOLD

120 programs for A/R, office management, clinical studies, referring physician reports, electronic claims submission. Includes on-line help, full security with audit trails, patient name orientation, \$5,900. FREE REMOTE DEMONSTRATIONS AVAILABLE. Requires hard disk, 256K, DOS. PHYSICIANS PRACTICE MANAGEMENT, INC. 1810 South Lynnhurst Drive, Suite Q Indianapolis, Indiana 46241 In the continental U.S. call (800) 426-3545 Indiana residents call (800) 792-3525

PC CLAIM

Physician's office insurance claim filing with printed insurance forms & paperless claims processing. Overnight electronic claims submission. SPEEDS BLUE, MC CARE, PRIVATE INSURANCE SETTLEMENT. Includes CPT, ICD, HCPC Codes by specialty & 3800 3rd party payors. 23 programs, 3 diskettes, user manual. DOS/190K/modem/min. 2 floppy drives or hard disk. \$229.95. MONEY BACK GUARANTEE. PHYSICIANS PRACTICE MANAGEMENT, INC. 1810 South Lynnhurst, Suite Q Indianapolis, Indiana 46241 In the continental U.S. call (800) 426-3545 Indiana residents call (800) 792-3525

DRUG INTERACTIONS

Computer assistance with patient management. Enter up to 20 drugs by brand or generic name and get report of possible drug interactions. Over 500 drug names/1900 entries in memory. 128K. Mono & printer needed. Extremely thorough. \$83 (from PC, add 6% tax). Send addressed stamped envelope for sample report. Dr. Richard H. Jethers 4800 Custer Drive Harrisburg PA 17110

INCREASE DICTATION OUTPUT

Word processing for offices using dictation/transcription. MEDICT PC is based on user defined problem templates. Save time and cut cost by dictating and transcribing only data unique to patients. Letters may be mixed with progress notes. \$120. Demo available. For PC-DOS, MC-DOS. Dealer inquiries welcome. PHYSICIAN INFO SYSTEMS, INC. 801 E. Harrison St. Suite 105 Seattle, WA 98102 (206) 527-4010

SOFTWARE MUSIC

TUNESMITH/PC™

Now you can make GOOD MUSIC on any IBM PC. It's easy with this amazing Music Development System—there's an On-Line TUTOR to guide you, plus a complete HELP screen. Simulated CHORDS allow you to create complex music. Special-purpose FULL-SCREEN music editor. 10 SAMPLE tones to educate and entertain. Requires 96K, 1 drive, 80-column display. Introductory offer: \$49.95 (plus \$5 shipping).



BLACKHAWK DATA CORPORATION

307 N. Michigan Ave. Chicago, IL 60601 VISA/MC/AMEX (800) 328-5727 ext 131 in Minnesota (800) 742-5685 ext 131

SOFTWARE One-of-a-kind

COMPUTERIZED GREETING CARDS

Unique programmable greeting card. You choose 1 of 9 names, 1 of 7 graphics-Xmas, New Years, Bday, Anniv., Wedding, Grad. Personalize the card with your own message, your name, the receiver's name. Reusable. IBM & compatible with color graphics. \$29.95 (CA residents add 6%) allow 4-6 wks for delivery. GOLDMINE ENTERPRISES PO Box 481800 Los Angeles, CA 90046 MC/VISA (213) 273-5471

BLUEBOOK

HOTEL 2000

A hotel management software package for the IBM-PC and compatible micro computers. Includes all hotel functions: Reservations, Front Desk, Housekeeping, Guest Accounting and Night Audit for the back office. It is a "USER-FRIENDLY" system which guides the user with menus and messages and requires no previous computer experience whatsoever. Demo kits are available from \$190.00 and individual modules from \$1,350. Dealer inquiries are welcome.

MASHOW CORPORATION
47 Marchwood Road Suite 2-G
Edison, NJ 08817
(212) 363-8864

SOFTWARE OPERATING SYSTEMS

MULTIPLE USERS UNDER PC DOS
MultiLine turns PC-DOS into an efficient multi-user multi-tasking operating system. Additional users are supported by attaching inexpensive CRT terminals or modems to serial ports on the PC and can run normal applications designed for PC-DOS. Includes print spooling, keyboard enhance, and communications software.



THE SOFTWARE LINK INCORPORATED
8001 Dunwoody Place Suite 336
Atlanta, GA 30338
(404) 998-0700

SOFTWARE PREVENTIVE MAINTENANCE

MAINTENANCE & INSPECTION

An easy-to-use computerized method to organize, operate, and control an effective preventive maintenance system. Applicable to any type of business or industry. Full screen input and displays, plus function key help command. Maintains historical data, creates work orders, and provides numerous reports. Foreign language versions available. For information write to:

PENGUIN COMPUTER CONSULTANTS
P.O. Box 20485
San Jose, CA 95180
(408) 997-7703

SOFTWARE REAL ESTATE

REAL ESTATE TOOLS I

Over 45 powerful, easy-to-use, menu-driven analyses of mortgages (regular, balloon, GPM, constant principal, wrap) leases, construct. Loans and variable/guaranteed cash flows plus amortizations. Computes IRR, NPV, FIRR, price, points, yield, etc. For IBM PC/XT/compatibles, 128K-2.05 drives. 228-page manual. \$299.
ANSIDRA SOFTWARE INC.
2801 N. Sunny Drive
Carrollton, Texas 75006
(214) 446-4340

PROPERTY MANAGEMENT PLUS

A new easy-to-use system for single or multi-family properties. Prints checks, rent statements and receipts. Reports—late rents, expired leases, vacancies, income/expenses, and operating statements. Includes a bank reconciliation feature and graphics capabilities! Up to 70% reduction in management time. \$675.
REALITY SOFTWARE COMPANY
1908 South Pacific Coast Hwy., #229
Redondo Beach, CA 90277
(312) 372-9419

SOFTWARE SCIENTIFIC

MATRIX 100

Powerful Matrix operations with single statements in IBM PC BASIC. Perform multiple regression, solve simultaneous equations, invert matrices, etc. MATRIX 100 commands are fast, reliable and easy to use.
Requires 128K. Price \$80.00 (\$4 shipping & handling. CA residents add 6.5% tax).
STANFORD BUSINESS SOFTWARE, INC.
4151 Middlefield Rd., Suite 215
Palo Alto, CA 94303
(415) 424-9499

LITERATURE FILING SYSTEM

SearchLit Version 2.1 stores & searches bibliographic data. Retrieval based on key word index, file, author, source or abstract. Absolutely no programming required. Mainframe downloading. Multi-user data entry. Publication-quality bibliographies. Sorted output. Any DOS. AT-compatible. \$249.50. Send \$10 for demo disk.
MEDSOFT
1595 Sequel Dr. #350
Santa Cruz, CA 95065
(408) 476-7106

SOFTWARE SERVICES

TAPE TO DISK CONVERSION

Convert any 9 track magnetic tape to or from over 200 formats including 3 1/2", 5 1/4", 8" disk formats and word processors. Formats available include IBM-PC, APPLE, Altos, TRS80 8" CP/M, Display, IBM SYS/370, Macintosh, Wang, LANIER, OS/2 and 200 more. Disk to disk conversions also available. Call for more info.
PIVAR COMPUTING SERVICES, INC.
47 W. Dundee Rd.
Wheeling, Illinois 60090
(312) 459-6070

SOFTWARE SECURITY

BIT-LOCK® SECURITY

Guard your valuable software from PRACY. Our inexpensive security system protects you from lost profits. Copies will only operate with a BIT-LOCK device attached. BIT-LOCK's powerful multi-layered security has proven its effectiveness on IBM PC/XT, TRS-80, Apple and Commodore computers. Turn the test of time MICROCOMPUTER APPLICATIONS
7805 So. Windermere Circle
Littleton, CO 80120
(303) 922-6410

SOFTWARE SORT

OPT-TECH SORT/MERGE

Extremely fast Sort/Merge program for the IBM-PC. Can sort or merge multiple files containing fixed or variable length records. Run as a DOS command or call as a subroutine, plus many other features. Now also sorts @BASE II files! Compare before you buy any other. Write or call for more info. \$38.
OPT-TECH DATA PROCESSING
P.O. Box 2167
Humble, TX 77047
(713) 454-7428

INTERNAL SORT FOR BASIC

INSORT—A FAST & easy to use quicksort subroutine written in C & assembler. CALLABLE from BASIC. Sorts an unlimited number of records in memory on up to 8 keys of mixed type: ascending/descending. Like having a SORT built into the language. Works w/compatibles. Compiled & interpreted, all DOS versions. \$49.95-\$250. 24h MC/VISA/CHECK PA. -6% tax.
NATIONAL SOFTWAREWORKS
65 East Elizabeth Avenue
Bethlehem, PA 18018
(215) 867-4800

SOFTWARE SPREADSHEETS

1-2-3/SYMPHONY TEMPLATES

MAKE INSTANT USE OF YOUR LOTUS SPREADSHEET
1. 1984 Federal Tax Calculator
2. Personal Accounting System
3. Personal Mailing System
\$35 ea. -2 or more on one disk \$30 ea. VISA/MC. 30 Day money Back Guarantee. ORDER TODAY!
EASY-AS - INC.
Suite 402, 36 S. Charles Street
Baltimore, MD 21201
(301) 539-5540

SOFTWARE STATISTICS

SIGSTAT

SIGSTAT includes over 30 programs of the BMD statistical series, plus many advanced new features. Mainframe capacity (up to 80 var.) for run—(e.g., ANOVA, regression), multivariate (e.g., canonical, factor analysis, time-series, multidim scaling, crosstabs, plots, and much more). 8087 support opt. 256K, DOS, \$595.
SIGNIFICANT STATISTICS
3336 N. Canyon Road
Palo Alto, CA 94304
(801) 377-4890

NWA STATPAK

Powerful data manipulation utilities, ASCII data structure for interface to databases, word processors, etc. Statistical functions include probability, descriptive statistics, regression and correlation, non-parametrics, distribution functions, means testing, survey data analysis, & ANOVA. \$485.
NORTHWEST ANALYTICAL, INC.
520 NW Davis St.
Portland, OR 97209
(503) 224-7727

ELF-THE STATISTICAL PKG.

Reads & writes Visi-Calc, SuperCalc, Multigran, @Base II, etc. Does Factor Analysis, Principal Components, Discriminant Analysis, Stepwise Regression, ANOVA (1 & 2 way), correlations, probabilities, t-test, crosstabs, Frequencies, Transformations, permanent Database, and more. MC/VISA.
THE WINCHENDON GROUP INC.
P.O. Box 10339
Alhambra, VA 22310
(703) 960-2597

BLUEBOOK

MATRIX LANGUAGE

GAUSS is a HIGH PERFORMANCE, FULL-FEATURED matrix programming language for IBM PC. Uses the 8087 EXTREMELY FAST—10 to 15% faster than IBM API. STATE-OF-THE-ART numerical routines. EASY TO LEARN—uses standard mathematical syntax. INTRODUCED: \$250. With 30 day money-back guarantee.

Applied Technical Systems
PO Box 6487
Kent, WA 98064
(206) 631-6679

THE SURVEY SYSTEM

An easy to use, menu driven system for the entry, editing, processing and presentation of questionnaire data. The system can produce cross-tabs and scores in banner format, statistics and bar charts. Tables and charts are camera-ready for professional presentations. Card readers and open-end coding/analysis options available.

CREATIVE RESEARCH SYSTEMS
9649 Del Oro Dr. P
Petaluma, CA 94952
(707) 765-1001

SOFTWARE

STOCK ANALYSIS

WINNING ON WALL STREET

Fast, easy, sophisticated system for making money in the market. TRADER'S DATA MANAGER, data base for all securities. Auto download. TRADER'S FORECASTER, technical analysis. Charting. TRADER'S ACCOUNTANT, 10 Reports. Simulations. WINNING ON WALL STREET—THE COMPLETE SYSTEM integrates all three. \$15 DEMO. SUMMA SOFTWARE
PO Box 2048
Beaverton, OR 97075
In OR, (503) 644-3212, (800) 792-2211

SOFTWARE

STRATEGIC PLANNING

EXPERT CHOICE®

For executives at all levels of management, strategic, tactical and operational. Supports complex decisions based on objective and subjective information about criteria and alternatives. Uses strategic planning, arbitration, resource allocation, employee evaluation and R&D planning.



Decision Support Software, Inc.
1300 Vincent Place Dept. C
McLean, VA 22101
(703) 442-7900
(800) 368-2002

SOFTWARE

TAXES

TAX PLANNING TEMPLATE

A deskette to be used with 1-2-3, or Symphony. User can toggle between 1983 & 1984 computations, and both years' tax tables. Computes state income taxes. 256K req. Flexible, menu-driven. Follows IRS forms by line number & incl. 1040 Sch. A, B, C, D, E, G, W, SE, forms 2119, 2441, 3468, 6251 \$75.

PERSONAL TAX PLAN™—PERMAR & ASSOC.
1125 Sunnyhills Road-Dept. PCM
Oakland, CA 94610
(800) 443-0100 \$544

TURBOTAX™

Full feature Fed. income tax preparation & planning software. 33 forms, schedules, & worksheets. FAST! Calculates fully cross-referenced return under 3 seconds. WINNINGS! Operates like a spreadsheet. Extends IRS print specs. Full depreciation support. Much more! CAIUX modules avail. Dec. FREE release in Jan. Reg. 192K. \$65 VISA/MC. (CA res. 6 1/2% tax). \$5 S&H. CmpSht. Inc.
5674 Honors
San Diego, CA 92122
(800) 621-0852 Ext. 355

TAX PREPARATION

1984 Federal tax program follows IRS forms and includes Item 340, Sch. A-G, R, RP, SE, & W and forms 2106, 2119, 2441, 3468, 3903, 4562, 4797, 4835, 4952, 4972, 5695 and 6251. Available for the IBM PC, PCjr, TiPro, and DEC Rainbow with MS-DOS. Requires 128K. Price: \$99, updates \$29. Check/MC/VISA.
DUNPHY SYSTEMS INC.
2215 Deswood Drive
Columbus, OH 43229
(614) 891-2131

TAX CALCULATION WORKSHEET

DOWN DR USE LOTUS 1-2-3 or MULTIPLAN? Then use their power to calculate YOUR taxes. We have spreadsheets that compute personal 1984 taxes using ALL possible methods allowing a choice of the most favorable. Includes 1040, 1 Sch. A-B, D, E, R&P, W 106, 2110, 2440, 2441, 3903 and 5695. All for \$29.95. With C.E. SE. 3468, 4562, \$39.95.

ComSys Inc.
66 Blackberry Road
N. Attleboro, MA 02760
(617) 666-1967

IBM/PC 1-2-3 TAX TEMPLATE

1984 1-2-3 Tax Template. Easy-to-use. Runs on 256K. Two options. First includes Form 1040, 3468, 4562, 4952, 5695, \$18.00. Second includes above plus SCH. F. Forms 2119, 3903, 4135, 4984, 4935, 4952, 4972, \$23.00. Immediate Delivery. Money-back if returned within two weeks.

SIRON-TAX

13445 SW CREMER DRIVE
Tigard, OR 97223
(503) 655-2143

TAXTIME™ for Lotus 1-2-3™ (formerly Tax 4-5-6)

• 1040-REG 256K \$35
1040 A, B, C, D, G, SE (2), W 6251A, -IRA, EIC

• 1040-PRD 320K \$95
Above forms + C, E, F, 2106, 2210, 2441, 3468, 3903, 4562, 4797, 4952 & 5695. Automatic support statements. Multi C, F, & 4562. All forms can be sent to IRS.

• CALIF-540 256K \$95
State forms 540, 540NR A, B, CEF, D-1, G, H, P, R, 3514, 3805L, N, U, X, 3885, & 3805. Can be merged with 1040 4512 K memory.

• NY-201-203 256K \$95
New York forms: IT-201, 201AT1, plus non-res 203, 203AT1, NYC 203, 112R, 220, 250, 360.

• CORP-1120 320K \$195
1120, 1120S, C, D, W 2220, 3468, 4255, 4562, 4626, 4684, 4797, K-1. Two programs in one package. Available in March 1985.

• PARTNER-1065 256K \$195
1065, O, F, K, K-1s, 4684, 4797. Stores indiv. data for each partner & prints K-1s. Can add State info. Available February 1985.

GENERAL INFORMATION

All forms look like the real ones & are highly integrated for minimum entry duplication. Change one entry & all others are updated in 10 secs. Most are IRS/State approved. Good for tax planning since tax tables are always shown on bottom screen window. Extensive use of menus & macros—easy input & output. Requires LOTUS 123/14 (IBM-Louis Developer Co.) and memory listed. Annual updates \$45-\$75.

TAXTIME™ by Austin Scientific, Inc.
1259 El Camino, Suite 2608
Menlo Park, CA 94025
USA (800) 227-2634 • 998
CALIF. (800) 772-2666 • 998

TAX PREPARATION TEMPLATE

1984 Federal tax template for use with Lotus 1-2-3. Follows IRS forms & schedules. Readily understandable. WRITTEN DOCUMENTATION, prepared by former IRS ATTORNEY-CPA, explains template: includes tax checklists of income & deduction items, examines frequently asked questions and tax issues relating to specific line items. \$99 VISA/MC/Chk.
1-2-3 TAX MASTER
P.O. Box 626035
Lincoln, CO 80162
(303) 972-0539

INTRODUCING TIME TRACKER

TIME TRACKER automatically keeps track of computer usage and prepares detailed reports. This is a must for income tax records, billing, justifying additional computers, and monitoring computer usage. Utilizes windows and function keys. To get the most out of your computer you need TIME TRACKER.
Visa/MC/Check/DO \$21.95 + \$1H
PO Box 203
POB 712
DeKalb, IL 60115
(815) 756-6286

INCOME TAX

TAXWORKS—the 10 min. 1040
Easy! Fast! Accurate!
Prints ready to file returns
• Federal and California
• IBM PC-DOS, MS-DOS, CP/M-80
• Individual \$100, Professional \$500
• 1983 demo \$25
Save time and money!
Order TAXWORKS



HOLLINGSWORTH BUSINESS SERVICES

861 Alma Road Dr., Suite T-2
Pacifica Palisades, CA 90272
(310) 459-2746
In Calif. 1(800) 232-1040

TAX-PREP™ '85

MULTIPLAN or LOTUS 1-2-3 USERS. Fast, easy system used by tax professionals to prepare 84 returns. 22 linked sheets. Very complete documentation. IRS accepted printout, overlays. Compares to systems costing \$1000. Specify your spreadsheet & IBM compal machine. \$129.95 + \$3.50 (VISA/MC) FAST delivery from E2WARE CORPORATION
17 Bryn Mawr Ave., Suite B
Bala Cynwyd, PA 19004
(215) 687-4064

SOFTWARE

TERMINAL EMULATION

BURROUGHS HANDSHAKE

AN ALL-SOFTWARE Burroughs M79 B3/1030 terminal emulator. HANDSHAKE allows PC or compatible microcomputer to communicate with existing Burroughs host programs. Also transfers files between the host and microcomputer disk storage concurrent with dialogue. Installed worldwide.
SOFTWARE CLEARING HOUSE
771 Need Road
Cincinnati, OH 45228
(513) 451-6742 Telex 24-1665

BLUEBOOK

BLUE LYNX

Reduce your dumb terminals with smart PCs and XT's. TECHLAND SYSTEMS is the nation's leading synchronous communications company with over 6,000 BLUELYNX installed. The BLUELYNX hardware/software product emulates the 5251/12 for the S/34 S/36 and S/38. Now bundled with AutoLynx for unattended operation... only \$795. BLUELYNX 3276 for the larger 43xx and 30xx mainframes, both SDD and BSC versions, now comes bundled with Data Reader, a utility that facilitates the formatting of host files into Lotus 1-2-3 dBASE etc. only \$795. Printer and up-and-down download support available with both versions.



TECHLAND SYSTEMS INC.
25 Waterside Plaza
New York, NY 10010
(212) 684-7786

VT100 on PC, i.e. XT, AT

ZST100/VT100 Smart Terminal Emulator
132 columns by windowing—no add. hardware. Double High/Double Wide Characters. Complete VT100 line graphics & Smooth scroll. Full keyboard shortcuts/IMACROS.

Bidirectional file transfers including XMODEM. Speeds to 38.4KB. High throughput. \$95.00 quantity. Dealer discounts available. 30 day money back guarantee. MC/Visa accepted. KEA SYSTEMS LTD.
#412 2150 W. Broadway
Vancouver BC Canada V6K 4L9
Support (604) 732-7011—Orders (604) 663-6712

SOFTWARE TRAINING

THE AUTHOR® & AUTHOR PLUS

THE AUTHOR® is a flexible, reusable, COMPUTER AUTHORIZING SYSTEM. Its ease of use, automatic branching, complete record keeping & thorough documentation make it a proven winner. THE AUTHOR PLUS® combines all of these features with GRAPHICS, expanded use of function keys, and full screen editing & entry. RAPTOR SYSTEMS INC.
324 South Main Street
Shifawater, MN 55082
(612) 430-2960

ATHENA COMPUTER WISDOM

Athena Software Training activates your IBM-PC to capacity. Progressive Video tapes and interactive guide books facilitate personal learning on programs such as R Base 4000, The Word, State of the Art General Ledger and Symphony. Athena delivers a convenient, affordable and simple solution to software understanding. Accept the wisdom of Athena. Available in VHS, Beta or 4.

VIDEO LOGIC
1530 S.E. 114th
Clackamas, OR 97015
COLLECT (503) 657-7942

SOFTWARE TYPESETTING

HIGH-TECH TYPESETTING

Trimline® your text via hot-free lines directly to our fully automated typesetting system. \$2 per K characters with a \$5 minimum. Same day service. 220 typesets in suites up to 72 point. Send \$15 + \$3 shipping for our 220 page guidebook or call toll free and use your MC/VISA or AMEX.
INTERGRAPHICS INC.
106A South Columbia Street
Alexandria, VA 22314
(800) 368-3342 or (703) 883-9414 in DC area

TYPESETTER II™

Find a standard printer type? TYPESETTER II produces high quality typeset forms on your Dot Matrix printer with 25 unique fonts and sizes. Give everything you print more impact with the most comprehensive typesetting system available for the IBM-PC. Price: \$99.95 checks/MC/Visa/CCD. Extra toppings: \$19.95.
DATA ARTS SOFTWARE
PO Box 1613
Troy, NY 12181-1613
(518) 273-3053

SOFTWARE UTILITIES

COPY PROTECTION BY MSD

The ULTIMATE diskette copy protection system designed for software developers and publishers. A variety of protection methods are available to suit your protection requirements. All IBM PC and XT environments are supported which includes DOS, BASIC (compiled and interpreted), Pascal, P-System, dBASE II and stand-alone systems. Customized systems also available. Requires 64K. Two disk drives.



MICRO-SOFTWARE DEVELOPERS, INC.
2141 W. West Main Street
St. Charles, Illinois 60174
(312) 377-5151

PADLOCK/PADLOCK II DISKS

PADLOCK harnesses the user with a method for providing protection against unauthorized duplication from DOS commands. PADLOCK II disks come preformatted with larger-serial number. PADLOCK II disks offer superior protection. Ask about our last data encryption product. All work with hard disk, EKE/COM files and all DOS versions. MC/Visa.
GLENDOES ENGINEERING
3920 Ridge Ave.
Arlington, HTS., IL 60004
(312) 392-2492

SCREEN DESIGN MADE EASY!

Screen Generator and Processor for BASIC programmers. This package combines a Screen Painter for creating and modifying screens and Macro Language and Compiler for quicker coding and testing. Features: COLOR field variables, compile input editing, line drawing. For BASIC, BASICA and BASIC. Compiler users include manual and reference card. \$99.95 VISA/MC accepted.



G. FREEMAN & COMPANY, INC.
15 Alton Road
Stamford, CT 06902
(203) 327-9968

SCREEN MANAGEMENT SYSTEM

SMS is simply the best utility available for designing, using, and saving color/monochrome screens. GOSUBS are supplied in BASIC to load, output, and edit screen data files. Inputs of extra features. We have been in business 15 years, winning many awards for programming excellence. Price \$195. Demo \$50. Manual \$10. VISA/MC/PC/XT/AT/PS/64K/1 disk.
DHA SYSTEMS, INC.
PO Box 1424
Saginaw, MI 48605
(517) 793-0185

Hard Disk DIRECT ACCESS™

The ULTIMATE utility for any hard disk user. DIRECT ACCESS is a powerful hard disk management tool. Organizes your software programs into a "user defined" menu system. Features attractive screen display, rapid access into an application using a single keystroke & easy to learn. Also handles batch files & complicated DOS commands. Order today. Only \$59.95 - \$75.00 shipping. MC/VISA.



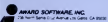
DELTA TECHNOLOGY
PO Box 1104
Eau Claire, WI 54602
(715) 832-0968

CopyWrite

CopyWrite backs up IBM PC software. We have not found anything that we can't copy. CopyWrite is revised monthly to keep up with the latest in copy protection and comes with a trade-in offer. It needs an IBM PC, 128K and one disk drive. But can use more memory or another drive. \$50 US. Check/Credit Cards. U.S. Inquiries.
QUAND SOFTWARE LIMITED
45 Charles St. East
6th Flr.
Toronto, Ontario Canada M4Y 1S2

BACKUP RESTORE

Backup database or other files from a Winchester to a floppy under concurrent CP/M and/or CP/M 86. • Automatic volume management • Selective file backup/restore • Database backup/restore • Compression reduces space required. In store data. Requires IBM PC/XT or clone with 128K RAM, one diskette drive, and Winchester disk. To order use MC/VISA or send \$99 to D&B.



AWARD SOFTWARE INC.
236 North Santa Cruz Ave.
Los Gatos, CA 95030
(408) 395-2773

FULL CONTROL FROM BASIC

Full development time, add speed & power to your programs with NUB. A library of assembly language sub-routines callable from BASIC, executes COM & EXE files, save & restore areas of the screen, clear & scroll windows, much more! Add DOS functions to your menu. Create fast help screens. Unlimited uses. All DOS versions. \$49.95 - \$250.50. MC/VISA/CHECK. PC + 64K+.
NATIONAL SOFTWARE
55 East Elmhurst Ave.
Chester, PA 19018
(215) 867-4600

DOS PATH Command for Data

Now Lotus 1-2-3, dBASE II, WordStar and most others can access data files no matter where they are located! Works with hard disks and floppies. DPATH is a system stay-resident function that allows you to organize your disk any way you like. Includes a screen-oriented maintenance utility & a 60-page manual. DOS 2.0/compat. \$25 - \$32 shipping & handling.
PERSONAL BUSINESS SOLUTIONS INC.
PO Box 757
Frederick, MD 21701
(301) 865-3376

SYMO: SYMBOLIC DEBUGGER

SYMO simplifies debugging by utilizing source symbols and line numbers. SYMO also lets you Step-by-step program output on separate floppies. Examines change real numbers. Assign permanent breakpoints. Backtrace instruction sequences. Profile your program to find hot spots. And much more. Priced at only \$125.
O-V SYSTEMS
400 Amherst St.
Nashua, NH 03063
(603) 881-7140

IBM USES CPM DISKS!!

Uniform lets you run CPM disks in your IBM 8 drive while using any DOS 2.0 program. Read and write the CPM disk directly or convert files to IBM format. Over 70 formats, all 85 and 96 K. IBM PC/XT/AT. Call for details. Next day shipping. Dealers invited. \$59.95 - \$5.95. IBM. University Micro Solutions.
BLUE HERON PUBLISHING CO.
8350 Lincoln Avenue
Shake, Illinois 60077
(815) 895-3602

OH-WINDOWS FOR C

Powerful window function library as easy to use as paint. Color, B&W, Mond. Sixty-five windows on four pages. Overlay, disk save/restore, print, titles, borders, line or page scrolling. Detailed manual with applications. Minimum system overhead. MS-C, Lattice C, C86, \$74.95. Demo \$5. PC/XT, MC/Visa, CAB Concepts, 125 Main Street, Suite F, Bay St Louis, MS 39520 (800) 824-3609

DOCUMENT COMPUTER USAGE

PC-LOG—Provides record-keeping system for computer usage. Meets IRS requirements for computer log documentation beginning in 1985. Records date, time, and task description for each computer session. Menu-driven utility program provides a user-selected summary of computer usage. \$39.00. PC-SEA INC., 2728 Omens Drive, Union Lake, MI 48065 (313) 360-1025

DIR-X: Directory xTended

Works like the DOS "DIR" command but does more. SEARCHES/DIRS directories for file names containing ANY CHARACTER STRING you specify. Searches all sub-directories on a hard disk. Great for hard disk maintenance and house-keeping! PREDICTS how much space your files will occupy on floppy disks. For DOS 2.0 or greater. \$35.00. 30 Day money-back Guarantee. MC/Visa/Check accepted. PANTHER ASSOCIATES Rt. 1, 1014 Omarron Circle, Rossmore, Texas 76262 (817) 379-5296

NEW! BASIC UTILITIES

Compile Trace Compare

AUTOCR, Pascompiler. Fast compile. Saves disk space. Removes line numbers. Requests 256K. AUTOTRAC Single step or continuous trace in COMPILE or BASIC. Break on variables/lives. AUTOREM removes and restores REMarks. Prints program w/REMARKS down right side of listing. AUTOCOMP Fast compare of program differences \$49.95 each (includes RANDOMIC and SPOOLER) any 3 for \$99.95, all 4 for \$129.95; e/h \$2.50 each. TIMESHARE ASSOCIATES, INC. 10202 Robinson, Overland Park, KS 66212 (913) 642-7564

NOLINK™

ErGo NoMeCs? Eye strain? With just a keystroke you can change your blinking cursor into a friendly solid block reverse video cursor. Give your eyes a rest! \$24.95 plus \$5 s/h. Call toll free 24 hr. For further information see advertiser index listing by NostRADAMUS.

NOSTRADAMUS

5320 South 900 East, Salt Lake City, UT 84121 1-(800) 453-5433

CONTROL YOUR HARD DISK

FMS provides control of your hard disk through Back-up, Archive, Restore, Scratch and Browse facilities. Easy file/directory selection/insert and edit is provided along with an On-line catalog of off-loaded files. System is menu-driven with help facility. Intro. price is \$80. VISA/MC or check. MICRO-MAN SOFTWARE, INC. 535 S. Washington St., Ste. 207, Naperville, IL 60563 (312) 369-9296

PERSONAL COPIER™

Personal Copier copies EVERYTHING! and, our monthly trade-in offer GUARANTEES that you're up to date with new and ever changing protection methods. Fully automatic with easy-to-use two-step graphic screen instructions - anyone can use it. Every IBM PC used should have one. \$39.95 - \$3.00. MC/Visa. STOP SHUFFLING FLOPPIES WITH DISK-LESS™ The sure way to transfer copy protected software to convenient hard disks. Operates with Lotus 1-2-3, Symphony, Sidekick, Electric Disk, and more... call for our complete list. Another Personal product from Disk-Tech. See our display ad in this issue.

DISKTECH

DISK-TECH™

P.O. Box 162
Waco, TX 76783
(312) 365-2803

COPY 11 PC 2.0

Copy 11 PC is the backup insurance you need to protect your software investment. Copy 11 PC makes a backup of most protected software quickly & easily, and even allows several to be run from a hard disk (not for current list). For IBM PC, XT, AT. Also available for Apple II, Mac, GSA. \$39.95 - \$3.00 e/h VISA/MC/Check. CENTRAL POINT SOFTWARE, INC. 9700 SW Capitol Hwy., #1008, Portland, OR 97219 (503) 244-5762

SIDEWAYS PRINTING

Print spreadsheets, text files, etc., sideways on your IBM/Epson printer with the Digipon Print Package. Easy menu setup for selecting character style and size, margins, more. Includes character editor to create your own styles. Also, quick printer setup utility. All for \$49.95 (PA & 6% DISC, 12MR, check or M.O.). DIGITAL CONCEPTS, INC. P.O. Box 8345, Dept. 8 Pittsburgh, PA 15218 (412) 823-8314

WORDFIX

Convert WordStar files to standard ASCII text. Wordfix is easy to use & fast. No programming required. You can unhyphenate, unjustify, remove Ctrl Chars & dot command, and convert printer commands. Supports PC-DOS path and wildcard file names. WKS w/LAN file servers. For PC-DOS 11 thru 3.1 \$49. VISA/MC/AMEX. MicroDevelopers, Inc. 6285 SW Nimbus, Suite 130 Beaverton, Oregon 97005 (503) 641-7072

PEEK'S 'N' POKES... and more

Thousands of programmers enhance their programs and save time with PEEK'S 'N' POKES! The Disk (\$6 programs) & manual show you how to access and modify system status, perform DOS & BIOS function calls from BASIC or Pascal, and much more for only \$30. Want more? A perfect companion package, THE INSIDE TRACK gives you your programs assembler-assisted speed plus control over the keyboard, memory, programs, etc. Disk (\$6 programs) & manual for just 45 dollars. Shipping \$2.50/order MC/Visa.

DATA BASE

14 Bonnie Lane, Atlanta, GA 30328 (404) 256-3660. Orders (800) 421-5300 ext. R96

SOFTWARE

WORD PROCESSING

WordPerfect

A powerful word processing package which comes with special features such as a spelling dictionary, math, text columns, footnotes, headers/footers, and macros. Proportional spacing and special characters such as Greek, math and foreign symbols are supported. Easy to learn and use. \$495.

SATELLITE SOFTWARE INTERNATIONAL

288 West Center Street
Orem, UT 84057
(801) 224-4554

LASER TYPE

Laser Type is an intelligent text formatter capable of generating table of contents, preface, index, line tables for term papers, software & technical manuals, & books. Laser Type is highly command oriented with sophisticated commands including key insert, font selection based text, chapter section, subsection. \$995.

SOFTLAB, INC.

P.O. Box 679
St. George, UT 84770
(801) 628-4969

PC-WRITE™

Features: wordwrap, search/replace, justify, block move/copy/delete, headers/footers, etc. Help screen, quick ref card, 100 page manual. Split screen, edit two files at once. Disk with software and manual \$10; registration with support, source, and commissions \$75. Shareware: can copy and share with others. VISA/MC. QUICKSOFT

219 First North #224c
Seattle, WA 98109
(206) 282-0452

MY WORD! IS JUST \$25!

MY WORD! is a WS-like word processor for the IBM PC/XT/AT or compatible (even Tandy 2000). Sort, mail merge, quick print, use 256 char! Word wrap, 100+ operations, won't lose text, ASCII files. Manual with index included. Full source code (just \$25 more)! New! My Word! Extended version includes customization program, built-in calculator, utilities, more, for \$35. Source \$35. 96K, 1 drive, DOS 1.1, 2.0, 3.1, 3.0, 3.0-day money-back guarantee! TN T SOFTWARE, INC. 34069 Hainesville Road, Round Lake, IL 60073 (312) 223-0632

MICROSPELL™

A fast and flexible spelling corrector featuring a large lexical and user modifiable dictionary, in context display and correction, and automatic suggestion of alternate spelling. It 256K RAM available, keeps full dictionary in memory for very fast look up and nearly instantaneous suggestion of alternate spellings. Checks multiple lines without reloading dictionary. Many other features. Works with most word processors, including Microsoft Word. \$5.00 for demo. \$139. Ingram Systems, 3 Bayard Road, Suite 66, Pittsburgh, PA 15213 (412) 682-2192

WORDSTAR THE EASY WAY!

STANPLUS MAKES WORDSTAR TRULY USER FRIENDLY! CAPSLOCK & NUMLOCK indicators ONSCREEN, 70+ WordStar commands reduced to SINGLE KEYSTROKES via FUNCTION KEYS. Key definitions always displayed on line 25. Enhanced numeric keypad cursor controls. MACROS, much more. GREATLY REDUCES keystrokes, memorization & guesswork. POWER OF WS. NOW WITH UNMATCHED EASE OF USE. IBM PC, XT & Compat. 128K. All vers. WordStar PC DOS 1.1-3.0 & MS-DOS. Only \$109. VISA/MC check, m.o. UPGRADE YOUR SYSTEM TODAY!

APERSON SOFTWARE, INC. Dept. S

125 East Palace Ave., Suite 57
Santa Fe, NM 87501
(505) 984-8165

EXECUTIVE ASSISTANT™

THE 20TH CENTURY SECRETARY

A full scale word-processor/communication/database manager which sends overline, regular or electronic mail with a single keystroke. That's right, instant worldwide communication even if the addressee doesn't own a PC. MC/MAC. Automatic dialing, long transmitting. WORD PROCESSOR-complete on-line editing, word-wrapping, copying, lists, integrated text & graphs. DATABASE-online database with 100's of items, sorts, i.e. by zip code, plus mail merge. ONLY \$150 - with graphics \$225. ANALYTICAL SOFTWARE INC. 10939 McCre Road, Dallas, Texas 75226 (214) 340-2564

PC: Mart

"IBM COMPATIBLE"

64K

DYNAMIC RAM MEMORY I.C.'s

***4164-150ns \$2.40**

OEM • WHOLESALE • RETAIL

*4164-150/200ns 2.40

*128K (FOR IBM AT) CALL

*256K-150ns 11.95

*JA551-2/555B/TM100-2 129.95

*10MB HD W/CONTROLLER 649.95

*20MB HB (FOR IBM AT) 895.00

*40MB HD (FOR IBM AT) CALL

IBM PC/XT/AT CALL

MICROTEK, INC.
26541 Baldwin Road
Dearborn Heights, Michigan 48127

(313) 277-2862

"Trademark of IBM Corp."

PC EXPANSIONS

Quam 142A	\$189
Taco FD558	\$129
Tandon TM100-2	\$169
Tandon TM101-4	\$239
CDC 9409	\$114
Maynard Disk Controller	\$169
Sandster Series	\$361
Internal 10MB HD systems WSI	\$699
WS2	\$1079
MayStream tape backup	\$1229
Quadboard (64K)	\$254
Quadboard (384K)	\$379
Quadcolor I	\$199
AST SuperPlus (64K)	\$259
SuperPlus (384K)	\$384
MegaPlus (64K)	\$269
Advantage	\$129
IO Plus	\$299
Intel starter kit	\$699
HERCULES graphics board	\$349
Color Card with PP	\$169
HAYES Modems 300	\$199
Smartmodem 1200	\$489
Smartmodem 1200B	\$419
Set of 5 chips (64K)	\$25
256K chips (each)	\$15
8087 chip	\$139
Versatime Deflate disks (20)	\$49

VLM Computer Electronics

10 Park Place • Morristown, NJ 07960
(201) 267-3268 Visa MC Check or C.O.D.

IBM*

XT COMPATIBLE

OEM COMPONENT SALE

Computer Case	\$150.00
Key Board-KT5150	\$169.00
Power Supply	\$175.00
Mother Board-Bare	\$ 95.00
Mother Board without ICs	\$225.00
Mother Board with ICs	\$385.00

Dealers/OEM Buyers

Quantity Discounts Available

All items are 100% XT compatible as replacement kits. Boards with ICs are tested and burn-in with 1 year warranty. Evaluation units are available at \$2500 with 128K RAM, 10M Hard Disk, Floppy Drive and RGB Card.

Price change without notice

Call for current prices

IBM is a trademark of International Business Machines



HitTech International, Inc.
1180 Madison Way, Suite M
Sunnyvale, CA 94086
(408) 738-6661 FAX 50422 HITCH

CIRCLE 56 ON READER SERVICE CARD



714/898-0336

MANUFACTURING

PROM BURNER

2716
2732
2764
27128



\$249.00

Complete MS-DOS, PC-DOS Software Package allows reading, storing to disk, recalling, and burning! Also may read INTEL hex format file or GMD output from assembler

- On-board voltage generator
- Optional extension cable and "Gang Burner"
- High-speed algorithms burns 2764 in 45 seconds!
- No interference with normal computer operations

8781 Machine Drive Huntington Beach, CA 92648



THE GRAYSCALER™

A module to retrofit any color graphics card to gray scale operation. RGB equivalent 16 shades of brightness on your monitor ends the fuzzies, adds capability. Simple installation on rear of color card. Software transparent phono jack output replaces RGB monitors for a fraction of the price.

\$39.95 - \$2.00 S & M
VISA/MC/COD 6% tax in CA

ACAD COMPUTER

17553 Yorkshire Ave., Yorba Linda, CA 92686
(714) 326-1023

9-5 M-F

CIRCLE 57 ON READER SERVICE CARD



THE BUYERS GUIDE

THE MASTER DIRECTORY
OF PRODUCTS FOR THE
IBM PC, PC XT, PCjr
AND MOST COMPATIBLES!

AVAILABLE AT YOUR
LOCAL NEWSSTAND AND
COMPUTER STORE

CUT RIBBON COST

Re-ink
most
fabric
ribbons
with only
one machine



INK MASTER
\$159.00

- No Fuss No Mess
- Simple to Use
- Versatile
- Adjustable



E-ZEE INKER
\$39.50

BORG INDUSTRIES

525 Main Street
Janesville, Iowa 50647

ORDER TOLL-FREE:
800-553-2404
In Iowa: 319-767-2976
Visa MC accepted

IBM

PC



2 Floppies 360K controller

KEYBOARD \$125 IBM COLOR CARD \$249
PLATONICS COLOR PLUS \$378
immediate availability

IBM — XT in stock!! & CALL

COLUMBIA, COLORADO CABLE AT DESKTOP **CALL**

BHRT- NEVADA (800) 845-5555

ORDERS INFORMATION: (702) 451-3386
P.O. BOX 50029 HENDERSON, NV 89050
FAX: (702) 451-3386

CIRCLE 58 ON READER SERVICE CARD

PC MAGAZINE • MARCH 19, 1985

3M

diskettes

**5 1/4"**Specify soft,
10 or 16 sector

Minimum Order 50

Single sided
double density**1.55** ea.Double sided
double density**2.08** ea.Certified Check - Money Order - Personal Check Allow up
to 2 weeks for personal checks to clear. Add \$3.00 per 100
or \$6.00 to each order for U.P.S. shipping charges
(NJ Residents add 6% sales tax)**DATA**
EXCHANGE, INC.178 Route 206 South, P.O. Box 993
Department C
Somerville, N.J. 08876 • (201) 874-5050

CIRCLE 55 ON READER SERVICE CARD

IC's**PROMPT DELIVERY!!!**
SAME DAY SHIPPING (USUALLY)

OUTSIDE OKLAHOMA, NO SALES TAX

8087-G Co-Processors \$131.25

DYNAMIC RAM

256Kx1 150 ns \$12.79

128Kx1 150 ns 17.50

64Kx1 150 ns 2.44

64Kx1 200 ns 2.57

EPROM

27256 32Kx8 300 ns \$34.97

27123 16Kx8 250 ns 10.97

27C64 8Kx8 200 ns 11.97

2764 8Kx8 250 ns 5.31

2732A 4Kx8 250 ns 5.99

2718 2Kx8 450 ns 3.21

STATIC RAM

6264P-15 8Kx8 150 ns \$16.75

6116P-3 2Kx8 150 ns 3.75

QUANTITY ONE PRICES SHOWN

OPEN 8-11 DAYS: WE CAN SHIP VIA FEDEX ON SAT

MicroCircuits USA, INC. 1000 CADDO

Factory New, Prime Parts

MICROPROCESSORS UNLIMITED

24 000 South Perry Ave.

80702 OK 74101

(918) 267-4961

Prices shown above are for January 21, 1988.

MicroCircuits USA, Inc. is a wholly owned subsidiary of MicroCircuits Corporation, a public company listed on the New York Stock Exchange under the symbol MICR. MicroCircuits Corporation is not responsible for the accuracy of the information contained in this advertisement.

**THE \$3.95 PERIPHERAL
THAT CAN SAVE YOU
HUNDREDS OF DOLLARS**Before you shop, consult the CREATIVE
COMPUTING 1985 BUYER'S GUIDE TO
PERSONAL COMPUTERS & PERIPHERALS—
the complete hardware sourcebook with in-
depth product listings, comparative charts and
evaluations of hundreds of new microcom-
puters and peripherals. It will connect you to
the best values in new computer equipment.
Available at your local newsstand
and computer store.**COMING UP**A Member of the Ziff-Davis Family
of IBM PC Magazines**3270 PC Applications**The 3270 PC's Control Program and
unique hardware set it apart from the PC
and the PC-XT, and create incompatibil-
ities as well. *Tech Journal* explores pro-
gramming techniques for adapting PC
application programs to the 3270 PC.**IBM Professional Debug Facility**Advanced PC users want to know how
IBM's high-powered Professional Debug
Facility differs from DEBUG. We
review this new package.**Concurrent PC-DOS**Digital Research's latest member of the
CP/M family, *Concurrent PC-DOS*, is
yet another alternative to MS-DOS. Will
its multi-tasking and multi-user capabil-
ities be enough to seduce PC-DOS and
MS-DOS users? Our review of *Concur-
rent PC-DOS* suggests an answer.**JRAM for the PC**The JRAM-2 distinguishes itself from
competitive memory boards with a de-
sign that supports both 64K and 256K
chips. Eight JRAM boards used in an ex-
pansion chassis can create a 16-
megabyte RAMdisk. *Tech Journal* eval-
uates Tall Tree's package.**Customized V-DISKS**Configuring a virtual drive for a PC starts
with a look in the back of the DOS man-
ual. It ends with *Tech Journal's* explana-
tion of how and why the procedure uses a
portion of RAM to emulate a disk drive.**IF YOU
SUBSCRIBE TO****PLEASE READ
THIS**... Take a moment now and remove your
mailing label and save it with this message.
Your label is very important and helps us to
help you quickly!• When moving, send us your label with
your new address 8 weeks before you
move to PC MAGAZINE, P.O. Box 2445,
Boulder, Colorado 80322.• If you have a question about your
subscription, simply send us a note with
your label, or a note with your name,
address and Personal Identification
Number to P.O. Box 2445, Boulder,
Colorado 80322.

Your P.I.N. 802222	Your Name Your Company Address City State Zip	Your Expiration Date OCT 83 Affix label here
-----------------------	--	--

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

If you have just subscribed, you'll receive
your first issue in 30 to 60 days.

When You Want The Best, Call...

nbs inc.

National Business Software and Supplies

ORDER LINE 800-225-8800

IBM PC SOFTWARE			
VOLKSWRITER DELUXE	\$154	BASE III	5345
R BASE 4000	274	FRAMEWORK	345
LOTUS	CALL	SIDEKICK	35
SYMPHONY	CALL	FLIGHT SIMULATOR	30
WORDSTAR 2000	269	NORTON UTILITIES	48
MULTIPLAN	118	PRO KEY 3.0	79
		TRIVIA FEVER	30

TEAC #55-B DRIVES FOR IBM PC & COMPATIBLES DS/DD \$139

**Ribbons and Printwheels
EPSON-OKIDATA-NEC-DIABLO, ETC.
call for prices**

Information & Technical Support

(602) 967-5681

500 W. Broadway, Ste. 116
Tempe, AZ 85282



ORDER LINE

800-225-8800

**Mon-Fri
8AM-5PM**

No cash refunds—all sales final. 20% restocking fee. Add \$5 for credit card purchases. AZ residents add 8%. Prices subject to change, product subject to availability. Allow two weeks for personal/company checks to clear. All items are new with manufacturer's warranty. Software not warranted for suitability of purpose. Shipping and handling add \$5 per order. Minimum order \$50.

3/85

CIRCLE 105 ON READER SERVICE CARD



Precision Data Products™

P.O. Box 8367 • Grand Rapids, MI 49508
Outside U.S.A. (616) 452-3457
Michigan 1-800-632-2468
Outside Michigan 1-800-258-0028

**3M diskettes give you
nothing to worry about.
Except missing this sale.**

Precision Data's Prices Unlimited Warranty on All 3M Diskettes	
\$1.49 Single Side Double Density	\$1.99 Double Side Double Density
Deluxe boxed product complete with Tyvec Envelopes, Write Protect Tabs and Labels. Soft or Hard Sector. Per Diskette: 1000s of 50 or more. Sold in Boxes of 10.	
SS-00-96 TPI - RH	\$2.37
DS-00-96 TPI - RH	\$2.95

NEW!

3 1/2" Micro Disk	\$3.15
5 1/4" Hi Density Disk (For IBM PC/AT)	\$5.15

(8" Diskettes available at similar savings)

3M 5 1/4" Head Cleaning Kit (Good for 10 cleanings)	\$11.95 ea.
3M Certified Data Cartridge	
DC 300XL	\$20.20
DC 600XL	\$22.85
NEW! DC 1000 (For 3 1/2" Drive Backup)	\$14.99 ea.

COMPLETE LINE OF 3M DATA RECORDING PRODUCTS
Quintaries less than 30 Diskettes, add 10% Shipping & Handling. 14.00/100 or fewer Diskettes: \$3.00/5 or fewer data cartridges... Continental U.S.A.
MI Residents, add 4% Sales Tax, C.O.D.—add \$2.00

ORDER NOW!

CIRCLE 123 ON READER SERVICE CARD



FREE PRODUCT INFORMATION

Learning more about a product that's advertised or mentioned in an article in this issue of PC is as simple as 1-2-3—and is absolutely free!

1

Print or type your name and address on the attached card. Please use only one card per person.

2

Circle the numbers on the card that correspond to the numbers at the bottom of the advertisements and articles for which you want more information. Key numbers for advertisers also appear in the Advertiser's index.

3

Simply mail the card, and the literature will be mailed to you free of charge by the manufacturer.

Now's an ideal time to consider having us start you as a PC subscriber. 26 issues cost you only \$29.97...a savings of 14% off the full one-year subscription price. Just check the box at the bottom of the reply card.

The address on the attached card is for product information only. Editorial inquiries should be directed to PC, One Park Avenue, New York, New York 10016.

Feature
• En
• Cu
• In
• Fu
• Co
• Ni
• Ov
• Sp
• E
Pr
Tr

M
T
T

BAC

• Can Be
• SUCCE
• Works
• Create
• Many
SECT
• Exam
• Modifi
• Comp
• Search
DISK MA
"protectio
formatting
requires at
1.1b, and
instructions
plus \$3.10
Framingham
Dealer/11



TM

Valid after July 15, 1985

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125
 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150
 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175
 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200
 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225
 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250
 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275
 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300
 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325
 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350
 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375
 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400
 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425
 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450
 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475
 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500
 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525
 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550
 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575
 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600
 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625
 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650
 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675
 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700
 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725
 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750
 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775
 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800
 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825
 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850
 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875
 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900

Please indicate which of the following microcomputers you currently own and/or plan to buy in the next 12 months.

	I Own	I Plan to Buy
IBM PC	A	H
IBM XT	B	I
IBM PC AT	C	J
PCjr	D	K
3270 PC	E	L
XT/370	F	M
Other (specify)	G	N

3 For what, if any, business application(s) do you use the microcomputer you currently own?

PLEASE PRINT CLEARLY—Use only one card per person.

NAME _____ PHONE NO. (____) _____

COMPANY _____ TITLE _____

ADDRESS _____ APT. _____

CITY _____ STATE _____ ZIP _____

(Zip code must be included to insure delivery) PC 3/19-2

4 ☐ Please send me one year (26 issues) of PC Magazine for \$29.97 and bill me. (Full one year subscription price of \$34.97.)



TM

Valid after July 15, 1985

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125
 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150
 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175
 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200
 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225
 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250
 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275
 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300
 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325
 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350
 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375
 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400
 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425
 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450
 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475
 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500
 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525
 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550
 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575
 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600
 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625
 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650
 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675
 676 677 678 679 680 681 682 683 684 685 686 687 688 689 890 891 892 893 894 895 896 897 898 899 900

Please indicate which of the following microcomputers you currently own and/or plan to buy in the next 12 months.

	I Own	I Plan to Buy
IBM PC	A	H
IBM XT	B	I
IBM PC AT	C	J
PCjr	D	K
3270 PC	E	L
XT/370	F	M
Other (specify)	G	N

3 For what, if any, business application(s) do you use the microcomputer you currently own?

PLEASE PRINT CLEARLY—Use only one card per person.

NAME _____ PHONE NO. (____) _____

COMPANY _____ TITLE _____

ADDRESS _____ APT. _____

CITY _____ STATE _____ ZIP _____

(Zip code must be included to insure delivery) PC 3/19-1

4 ☐ Please send me one year (26 issues) of PC Magazine for \$29.97 and bill me. (Full one year subscription price of \$34.97.)



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 27346 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE



P.O. BOX 13848
PHILADELPHIA, PA 19101



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 27346 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE



P.O. BOX 13848
PHILADELPHIA, PA 19101



PC Product Index

RS# PRODUCT ADVERTISER PAGE#

ACCOUNTING SOFTWARE

269	IBM Software	IBM Corp.	154-155
360	Versa Business Sent	H & E Computers	332
420	RealWorld Software	RealWorld Software	2

INTEGRATED ACCOUNTING PACKAGES

470	Windows DBASE II/Acc 5/W	Indian Ridge Enterprises, Inc.	11
		SBT Corp.	16

TAX AIDS

131	Tax Cut	Best Programs	99
327	Tax Preparer	Howardsoft	51

COMMUNICATIONS SOFTWARE

326	Comcast	Micro Staff Inc.	26
333	Transponder	Micro Staff Inc.	174

TERMINAL EMULATORS

128	Verm	Coefficient Systems Corp.	173
-----	------	---------------------------	-----

OTHER UTILITIES

152	Copy II PC	Central Point Software	157
114	Printworks	Bullish Investments	96
475	Apple Turnover	Vortex Systems	153
155	Public Domain	Reference Desk	318

FINANCIAL PLANNING SOFTWARE

111	Macro-Track	Black River Software	107
114	Bullish Investments	Bullish Investments	238
309	Lumen Software	Prentice-Hall	27
170	Slex	Triad Associates	308

GRAPHICS SOFTWARE

311	PC Draw	Micrografe	82
184	PC Eye	Chorus Data Systems	29
118	Gift of Sight	Data Corp.	368
302	PC Paintbrush Software	Tecma	C-4

PROJECT MANAGERS

102	Pak Micro	AGS Management Systems	187
-----	-----------	------------------------	-----

SOFTWARE FOR PROFESSIONALS

149	Sidekick	Borland International	21
187	House Base	Amber Systems	30-31
130	Northern Software	Northern Software	252

ENGINEERS/SCIENTISTS

331	8087 Chip	Microway	94
-----	-----------	----------	----

WORD PROCESSING SOFTWARE

280	Word Processing	Leading Edge	53
154	Word Perfect	Sawfile Software Int'l (SSI)	46
509	Xyrite	XyQuest	96

RS# PRODUCT ADVERTISER PAGE#

WORD PROCESSORS

385	Volkswriter Deluxe	Lifetree Software	235
-----	--------------------	-------------------	-----

WORD PROCESSING AIDS

126	Fancy Font	SoftCraft Inc.	186
-----	------------	----------------	-----

MULTIFUNCTION SOFTWARE

272	IBM Software Smart Software	IBM Corp.	65-68
122	Software	Innovative Software	158-159
		IBM Systems	24

INTEGRATED SOFTWARE

494	The 5-Pack Ability	Paradise Systems	215
		Xanadu Technologies, Inc.	2-3

ENTERTAINMENT SOFTWARE

387	Tout Communications	Tele Learning	87
-----	---------------------	---------------	----

COMPILERS

147	Turbo Pascal Compiler	Borland International	25
-----	-----------------------	-----------------------	----

OTHER LANGUAGES

391	Language Software	The Programmer's Shop	238
214	Reiter Basic	Samuel Software	308

DATA BASE MANAGERS

525	Knowledge Man	MDBS	88-89
218	Revelation	Cromex, Inc.	104
426	Rbase	Micromin	96-97
	Database Manager	Potomac & Pacific Engineering	4
193	Database	Software Solutions	193

PROGRAM DEVELOPER/GENERATOR TOOLS

368	Turbo Plus	Noradams	63
431	Pocket APL	STSC	69

TEXT EDITORS

182	SPR/PC	Comand Technology	73
378	Kedit	Mansfield Software Group	146

OTHER UTILITIES

305	Vocabulary Builder	Potomac Pacific Engineering	331
	Sideways	Pink Software	76
	Personal Copier	Dak Tech	326
136	Data Padlock	Glenco Engineering	246
303	LePrint	Lehigh Software Corp.	106
340	Disc Mechanic	MLJ Microsystems	306
346	Power Utilities	Norman Utilities, The	271
368	Hard Runner	Noradams Inc.	63
527	File Transfer	Personal Computer Products	157
	Copywrite	Quand Software Ltd.	106
517	TR Surge Suppressor	Transactor Systems	201

PC PRODUCT INDEX

RS#	PRODUCT	ADVERTISER	PAGE#
-----	---------	------------	-------

HARDWARE

* IBM PC	IBM Corp.	65-68
* IBM PCjr	IBM Corp.	65-68
IBM Micro Devices	IDR Micro Devices	247

IBM PC COMPATIBLE COMPUTERS

237	Erisson PC	Erisson	110-111
-----	------------	---------	---------

ACCESSORY CARDS

138	Fast Card from Theys	Theys Memory Products Corp.	17
-----	----------------------	-----------------------------	----

MULTIFUNCTION BOARD

512	Multifunction Board	Emulex-Peryst	184
501	Multifunction Board	Tecmar Inc.	C-2
540	Ultapack	Tang Laboratories, Inc.	234

VIDEO/GRAPHICS BOARDS

101	Graph Pak	AST Research	231
145	Hercules Graphic Card	Hercules Computer Technology	8
146	Hercules Color Card	Hercules Computer Technology	43
501	Graphics Master	Tecmar, Inc.	C-2
207	Color Pak	Tang Laboratories, Inc.	32

OTHER ACCESSORY CARDS

537	QIC-06	QIC Research	9
187	Color 400	Sigma Design	72

EXPANSION UNITS

486	PC Jr. Enhancement	Quadrant Corp.	220
-----	--------------------	----------------	-----

INPUT HARDWARE

280	The Light Pen	EPG Data Systems	73
507	Touchstone I	Touchstone Technology, Inc.	20

INTERFACE DEVICES

156	Isobar	Triglobe	327
108	Analoplot	Analoplot Co.	236

MASS STORAGE HARDWARE

293	Screening Disk/Back-Up	Mountain Computers	45
229	Genos Tape Backup	Genos Systems, Inc.	207
112	Tape Backup/Hard Disk	Exigent Systems, Inc.	84-85
247	Bubble Memory Board	Helix Laboratories	212
334	Identidisk	IDR Associates	36-37
317	Megaflight	Kamerling Labs	10
437	Classic Drive	Maynard Electronics	78
373	Hard Disk Drive	Space Coast Systems, Inc.	126
538	Disk Subsystem	Statewide Micro Electronics	49
*	System Image	System, Inc.	54

MODEM

356	Modems	Quint	50
-----	--------	-------	----

RS#	PRODUCT	ADVERTISER	PAGE#
-----	---------	------------	-------

NETWORKING

103	AST PC Net II	AST Research	13
412	PC Net	Orchid Technology	44

OTHER COMMUNICATIONS HARDWARE

530	MOM	The MOM Corp.	231
-----	-----	---------------	-----

DISPLAYS/MONITORS

*	Primers	NEC Home Electronics Inc.	179-182
383	Quick Hard Disk Drive	Qebit	61

PRINTERS

106	Alpha Pro 301	Alphacore	113-113
186	Star Writer	C. Jack Digital Products, Inc.	147
162	Printer	IBM-DSO Division	223
*	Printer	Texas Instruments	C-3

DOT MATRIX

113	Printers	Citizen America Printer	108-109
-----	----------	-------------------------	---------

FURNITURE

199	Compuport	Compuport	234
-----	-----------	-----------	-----

DISKETTES

244	Mail Order Diskettes	Disk World!	287
289	Dynas Diskettes	Dynas	14
531	Maxell Floppy Disks	Maxell	1
123	3M Diskettes	Precision Data Products	308

SOFTWARE SECURITY

150	Super Key	Briland International	21
-----	-----------	-----------------------	----

KEYBOARD OVERLAYS

441	PC DocuMate	Systems Management	10
-----	-------------	--------------------	----

OTHER SUPPLIES

121	Disk Covers	Contemporary Computerware	39
167	Printer Switch	Intra Computer	86
353	Power Maker	Topex	22

LITERATURE

176	Periodicals	Data Sources	30
349	The Manual	Management Information Science, Inc.	35

ORGANIZATIONS AND SERVICES

216	D.D. Information Services	Data Decisions	77
140	D.D. Information Services	Data Decisions	30
370	NewsNet	NewsNet	28
*	Computer Insurance	SafeNet	96

The publisher does not assume any liability for errors or omissions in the product index.

Compuclassics

Software

ALPHA SOFTWARE

Data Base Manager II
Electric Desk

ASHTON TATE

dBase II
dBase III
Framework

BORLAND INTERNATIONAL

Sidekick
Sidekick (unprotected)
Turbo Pascal
Turbo Pascal (8087)
Toolbox

CONTINENTAL SOFTWARE

Home Accountant Plus
Tax Advantage

DECISION RESOURCES

Chartmaster

DIGITAL RESEARCH

C Basic Compiler
C Language

FOX AND GELLER

Quickcode III

LEADING EDGE SOFTWARE

Word Processor
Word Processor w/ Mailmerge
Wulshell

LIFEBEAT

Lattice C Compiler
LIFETREE SOFTWARE
VolksWriter Deluxe

LIVING VIDEO TEXT

Thinktank
LOTUS
Lotus 1-2-3
Lotus Symphony

MECA

Andrew Tobias - Managing Your Money
MICRO DATE BASE SYSTEMS
Knowledge Man

K GRAPH

K Paint
K Text

MICROGRAPH X

PC Draw

MICROPRO INTERNATIONAL

Wordstar
Wordstar Propack
Wordstar 2000

INFOSTAR

Charts +
Charts

MICROCRIM INC.

R Base Series 4000
Extended Report Writer
Clout II

HAYES

Smartmodem 1200B
Smartmodem 1200

HERCULES

Graphic Card
Color Card

OKIDATA

Microline 824A
Microline 844A
Microline 92P
Microline 93P

PRINCETON GRAPHICS

HX12 Color Monitor
Max 12 Amber

MICROSOFT

Word
Word w/ Mouse
Multiplan
Basic Compiler
Fortran Compiler
Project
Chart

MICROSTUF

Crosstalk
InfoScope

MULTIMATE INTERNATIONAL

Multimate

SATELLITE SOFTWARE

Word Perfect

SOFTWARE PUBLISHING

PFS Report
PFS File
PFS Write
PFS Proof
PFS Access
PFS Graph

SORCUM I.U.S.

Supercalc III
I.U.S. Order Entry
I.U.S. Accounts Receivable
I.U.S. Accounts Payable
I.U.S. Inventory Control
I.U.S. General Ledger
Series Plus (I.U.S. window)

TOSHIBA

Toshiba 1351

IBM

IBM PC-2 Drives - 256k

PC JUNIOR

Electric Desk
Wordstar
Home Accountant Plus

AMDEK

310A

AST RESEARCH

Megapius 64k
Six Pac Plus 64k

DIZCOMP

Intellimodem XL
Intellimodem XT
Intellimodem ST

CITON

Prowriter 8510
Prowriter 1550
Starwriter 20 CPS

Incredible Prices with Professional Support!

- Corporate accounts welcome
- We accept VISA & MasterCard
- No credit charge surcharge
- Free technical support

HOURS
Order desk & technical support open
8 a.m. to 6 p.m. Monday - Friday
10 a.m. to 2 p.m. Saturday

SHIPPING
\$4 per item UPS surface (\$6 for Blue Label), printers \$25
TO ORDER CALL:
1 (800) 328-4473 or
(818) 705-1895 (CA)

854 Canyon Street, Suite 104
Reseda, CA 91335
TERMS
All prices subject to change. We honor Cashiers Check (MO) Bank
Transfers immediately. Allow time for company & personal checks
to clear. California residents add sales tax.

**Keep current about the
rapid advances for
the IBM-PC without having
to leave your office.**

The Editors of PC Magazine
and Dean Meyer Associates
Cordially Invite
Corporate IBM-PC Users
to Participate in
Their First Series of Teleconferences

R.S.V.P. Immediately

(203) 431-0029

Ever increasing numbers of corporations using IBM PCs are concerned about their key executives falling behind the required PC "learning curve."

That's why they are sending selected executives to numerous seminars and conferences dealing with hardware and software innovations in desktop computing.

But, if you've ever participated in such a seminar or conference you know that the expense involved in travel and accommodations, the slowdown when key executives are absent from the office for one or more days and other inconveniences make attendance at such programs difficult if not impossible—even though they may prove valuable.

The Teleconferencing Alternative

Teleconferencing—connecting people in different locales by means of audio-quality telephone networks—has come of age. Indeed, as has been widely reported in the business press, teleconferencing techniques have evolved to the point where such programs surpass those that are conducted "residentially." One reason alone is sufficient to illustrate the advantages: teleconferencing seminars attract the very best authorities because they can moderate or participate in the program from the comfort of their own offices.

Now, PC Magazine is joining the teleconferencing revolution by combining its editorial resources with those of one of this country's leading office automation management consulting firms. The result is the first series of PC Teleforums, co-moderated by PC editor, Bill Machrone, and Dean Meyer, President of Dean Meyer & Associates.

Five Teleforums Scheduled

Five PC Teleforums will be con-

ducted in 1985 as follows. (Exact dates are to be determined on the basis of mutual convenience to participating companies.)

March	Integrated Multi-Function Packages (Guest Speaker: Kay Reditt, CogniTech Services Corp)
May	Training Programs for PC Users (Guest Speaker: Ray Hood, MicroTrek, Inc.)



July	Compatibles, Portables and Incompatibility (Guest Speaker: Peter Norton)
October	Long-Term PC-AT Experiences (Guest Speaker to be announced)
December	The Latest Hardware and Software—An Update (Bill Machrone, Editor, PC Magazine)

Limited Participation

To insure continuity and effective participation in the series participation is limited to 16 companies, with each committing to all five programs. (There is no limit to the number of attendees at each company's session. One spokesperson interacts for each company.)

Applications for participation are now

being accepted on a first-come, first-served basis. Each participating company will receive a comprehensive set of briefing materials prior to each Teleforum sufficient for its needs.

Briefing materials will include an agenda, case histories, reading and reference materials and supporting documentation. Additionally, each company will receive a full transcript of each forum after the program.

Methodology

No special equipment is required beyond an ordinary telephone jack and "speakerphone". Each Teleforum will be conducted via a high quality audio bridge which we will arrange. The moderator will control the flow of conversation so that there will be no difficulty in presenting questions or receiving responses.

Send For More Information Without Obligation

To receive a complete briefing on PC Teleforums, fill out and mail the coupon below or call (203) 431-0029. We'll answer questions and explain how your participation can serve as the central element of your company's PC education and development program. But we suggest you act promptly—*only 16 companies will be allowed to participate* in the first series and we expect to be fully subscribed very quickly.



Teleforums
c/o Dean Meyer & Associates
223 Mountain Road
Ridgefield, Conn. 06877

YES! I am interested in learning more about PC Teleforums. Please contact me so that I can receive complete details about my company's participation.

Name _____

Title _____

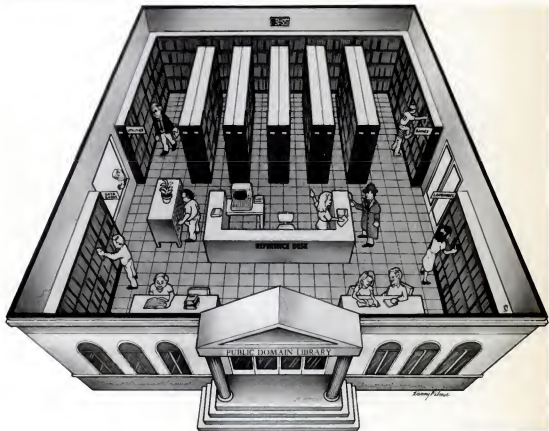
Company _____

Address _____

City _____ State _____ Zip _____

Telephone () _____

REFERENCE DESK SOFTWARE



The Brightest People Find the Best Sources

Even before PC's some of the most valuable information was free—at the library. In the computer age the most valuable information is software, and some of the most valuable software is also free—public domain software.

Both sources of free information can expand your horizons and save you hundreds, even thousands, of dollars—if you can find what you need among the vast amount of information available. When information overload leaves you clueless, the trick is to get pointed in the right direction by someone who knows the territory. The rest is elementary.

At the library or at your keyboard, when you need guidance in your quest for valuable information, your best resource is **the reference desk.**

PUBLIC DOMAIN SERVICE

Thousands of Free Programs

- Graphics
- Utilities
- Games
- Languages
- User-Supported Programs
- Databases
- Financial

Order Desk 1-800-372-4001
Information Line 1-513-372-4001

(8:00 A.M. to 8:00 P.M. E.S.T.)

ADDITIONAL SERVICES

At No Additional Cost

- Comprehensive Directory
- Monthly Newsletter
- Commercial Software Demos
- Radio Broadcast Information

Annual Service Fee \$50.00
 First 500 Respondents to this ad \$25.00
 Cost per disk, including postage & handling \$10.00

REFERENCE DESK SOFTWARE, INC.

54 Maple Street
 Xenia, Ohio 45385

CIRCLE 195 ON READER SERVICE CARD



IBM PC FLOPPY DISK SYSTEM

Basic system includes 256K, two floppy drives 360K each, drive controller and keyboard.

IBM PC 10MB SYSTEM

Basic system includes 256K, one floppy drive, keyboard, 10MB Hard Disk with controller (boots from hard disk)

CALL FOR LATEST SYSTEM PRICES

We have not given system prices due to continuous changes in the PC market and our policy of having the best prices and availability.

**IBM PC 20MB SYSTEM**

Basic system includes 256K, one floppy drive, keyboard, 20MB Hard Disk with controller (boots from hard disk)

IBM PC 30MB SYSTEM

Basic system includes 256K, one floppy drive, keyboard, 30MB Hard Disk with controller (boots from hard disk)

Choose from the widest selection of enhancement products for your IBM PC system at the best prices. Start with the basic system and configure it according to your needs. All Hard Disk systems are available with 2 floppy drives and backup devices (highly recommended).

★ PRICE WAR ★ CALL US LAST WITH YOUR BEST QUOTES ★

PRINTERS

EPSON	RX-80	\$229	FX-80	\$389
	RX-80FT	\$279	FX-100	\$549
LD-1500 Parallel	\$1,099	Serial	\$1,199	
LD-1500 Tractor	\$50	Carriage Reader	\$299	

OKIDATA	92P	\$349
INCLUDES PLUG & PLAY	93P	\$549
	84P	\$649

JUKI 1st Quality, 18 CPS, 13" wide	\$379
6100 Tractor	\$129

TOSHIBA 1351	\$1299	
Tractor	\$149 Cut Sheet Feeder	\$799

DYNAX DX-15	\$369
Keyboard	\$149
Tractor	\$99
Sheet Feeder	\$199

BROTHER	HR-25	\$599	HR-35	\$849
Tractor	\$119	Cut Sheet Feeder		\$199

QUME SPRINT	1140	\$1299
With IBM Interface Module	1155	\$1499

NEC SPINWRITER	\$699
2050	\$1299
3550	\$1699
8850	\$1699

NEC PINWRITER	CALL
P2	CALL
P3	CALL

MONITORS

PGS	MAX 12 Amber—Monochrome	\$179
	HX-12—Hi-Res Color	\$429
	SR-12—Super Hi-Res Color	\$599
	Scan Doubler	CALL

TAXAN 440 Color - Super Hi Res	\$549
---------------------------------------	-------

122A(M) ... \$169	121G(M) ... \$159	116A(L) ... \$149
300A (Composite) ... \$159	300G ... \$139	
AMPEK 310A (Mono) ... \$179		

MODEMS

MICROCOM ERA 2	\$359
PC Internal 1200 Baud w/software, 4 Yr. Warranty	

HAYES SMARTMODEM	1200 Standalone	\$439
	1200B w/software	\$369

QUBIE Standalone	\$329 Internal	\$299
-------------------------	----------------	-------

POPCOM Internal or Standalone	CALL
--------------------------------------	------

PROMETHEUS PROMODEM 1200	\$299
---------------------------------	-------

Modems under \$100. Prices & availability subject to change. We ship UPS. Shipping/handling charges vary. CDS require add. money order, cash or certified check only. For advance payment, please call first for warehouse number. Personal & Company credit sales 2 weeks to clear. 20% financing for no return. No P.O.s or foreign orders.

HARD DRIVES

TALL GRASS TECHNOLOGY	
20 MB w/20 MB Backup	\$2,399
35 MB w/45 MB Backup	\$3,799
70 MB w/60 MB Backup	\$5,999
Controller Card	\$140
Cartridge	\$40

QUBIE 10MB	CALL
EVEREX 10MB	\$699

MAYNARD 10MB/30MB			
10MB/WS-1	\$888	10MB/WS-2	\$1,029
30MB/WS1A	\$1,999	30MB/WS-2A	\$2,099
WS-1 Gemini	\$1,049	WS-2 Gemini	\$1,149
"The Gemini" includes 10MB Hard Disk & Half HI. Floppy			

FLOPPY DRIVES

TEAC HALF HEIGHT 558-DS50	\$109
----------------------------------	-------

CDC Full Ht. - DS50	\$139
----------------------------	-------

TANDON 100-2	\$139
Full Ht. DS50	

★ SUPER SPECIALS ★

64K RAM Set of 9 chips	\$25
-------------------------------	------

HAYES SMARTMODEM	1200 Standalone	\$439
	1200B w/software	\$369

8087 CHIP	\$109
------------------	-------

JUKI 6100	\$399
------------------	-------

MAYNARD 10MB/WS-2	\$1,029
--------------------------	---------

IBM PC Keyboard (original)	CALL
-----------------------------------	------

OKIDATA	92P	\$349
INCLUDES PLUG & PLAY	93P	\$549
	84P	\$649

BROTHER	HR-25 (23CPS)	\$599
	HR-35 (36CPS)	\$849

KEYTRONIC	
Deluxe Keyboard KB5151	\$179

ORCHID TECHNOLOGY	
Blossom 64-K (to 384K)	\$249
Turbo 186	CALL



NO SURCHARGE ON CDS, VISA or MC. AMEX 3%

NETWORKING

ORCHID TECHNOLOGY	
PC Net PLUS Starter Kit	\$799
PC NetBlossom, PC Turbo, PC NetPlusKam	CALL

IRMALINE

CALL FOR YOUR BEST PRICES

MULTI-DISPLAY CARDS

PERSYST	Mono OR Color	\$199
	RGB Color	CALL

AST	MultiGraph Plus w/clock & PP	\$349
	Serial Port Option	\$30

EVEREX Graphics Edge	CALL
-----------------------------	------

MYLEX	CALL
--------------	------

TECMAR Graphics Master	\$429
-------------------------------	-------

HERCULES	Mono Graphics	\$319
	Color Graphics	\$169

NEW STB Graphics Plus	\$299
------------------------------	-------

VUTEK Color with Parallel & Serial	CALL
---	------

PARADISE	
NEW Modular Card	\$299

MULTI-FUNCTION CARDS

ORCHID TECHNOLOGY	
Blossom 64-K (to 384K)	\$249
PC net/updates	CALL

NEW QUADBOARD	6 K (to 384K)	\$219
----------------------	---------------	-------

AST SIX PAK with 64K (to 384K)	\$249
---------------------------------------	-------

AST MEGA PLUS with 64K (to 512K)	\$249
---	-------

MISC. ADD ONS

8087 CHIP	\$109
------------------	-------

CABLE Parallel	\$20 Serial	\$25
Keyboard Extension, & ft.		\$10

PLATINUM DISKETTES	
Box of 10	\$29

VERBATIM Datalife DSDD	
Box of 10	\$27

COMPUTER ACCESSORIES DIRECTOR	P2	\$109
	P12	\$149

STANDBY POWER SUPPLY	300 WATTS	\$279
	200 WATTS	\$279
Surge Protection, up to 30 minutes Standby Power		

WILL CALL: Please call first for warehouse number.

COMPUTER 805-498-6635

3541 OLD CONEJO ROAD, SUITE 102, THOUSAND OAKS, CA 91320

Ad #794

Index To Advertisers

RS #	Advertisers	Page	RS #	Advertisers	Page	RS #	Advertisers	Page
102	AGS Management Systems	187	234	COMPUMAIL	319	229	Genoa Systems Corp.	207
106	Alphacom, Inc.	112-113	183	Computer Mart	272	136	Glenco Engineering	246
107	Amber Systems	30-31	185	Computer Mail Order	74-75	*	Gollan Co. Inc.	237
129	Applied Computer Products Inc.	90-91	135	Computer Warehouse	259	260	H&E Computronics	332
101	AST Research	231	125	Conroy-LaPointe, Inc.	40-41	247	Helix Laboratories, Inc.	212
103	AST Research	13	121	Contemporary Computerware	230	145	Hercules Computer	8
108	Audo Pilot	230	218	Cosmos	104	146	Hercules Computer	43
131	Best Programs	99	118	Datacopy Corp.	268	327	HowardSoft	51
111	Black River Software	107	140	Data Decisions	261	162	IBM-ISG	223
149	Borland International	21	216	Data Decisions	177	269	IBM-PC	154-155
150	Borland International	23	176	Data Sources	290	*	IBM-PC	65-68
147	Borland International	25	116	Diamond Software	77	334	IDE Associates	36-37
114	Bullish Investment Software	238	117	Discount Computer Centers	232	*	Indian Ridge Enterprises	11
152	Central Point Software, Inc.	157	*	DiskTech	326	321	Industries Best Micro	262
184	Chorus Data Systems	29	244	DISK WORLD!, Inc.	267	272	Innovative Software	158-159
113	Citizen America Printer	108-109	289	Dysan Corporation	14	167	Intra Computer	146
166	C.Itoh Digital Products	147	230	800-Software	56	104	JDR Microdevices	247
128	Coefficient Systems	173	235	Eastern Enterprises	305	122	J&M Systems, Ltd.	24
182	Command Technology Corp.	73	512	Emulex-Persyst	184	317	Kammerman Labs	10
228	Compu Add Corp	286-287	237	Ericsson	110-111	280	Leading Edge	53
199	Compucart	234	112	Express Systems, Inc.	84-85	303	LeBaugh Software Corp.	106
205	Compuclassics	315	242	47st Computer	92-93	385	Lifetree Software Inc.	235
			250	FTG Data Systems	73	282	Logicsoft	198-200
			305	Funk Software	76	349	Management Information Source	255
			252	Garden of Eden	86	378	Mansfield Software Group	146
						531	Maxell Computers	1

IF YOU BOUGHT THIS SYSTEM ANYWHERE ELSE YOU PAID TOO MUCH.



Let the experts at **Progressive Micro Distributors** show you how to buy or upgrade your business computer at a reasonable price. We are sensitive to all budgets and strive to keep you updated with the best available equipment and the most efficient support available. Call us and see . . .

ENTER VALUES.

PROTOCOL CONVERSION

AST RESEARCH	
PC/DX, 3270, 3780, BSC, SNA	*
DCA	
Ima (3278 Terminal Emulation)	\$895
Imake, Imatime, Imagint, Imacom	*
TECHLAND	
Bive Lynx 5251 model 12 & 3278	*
FORTE DATA, CXI	*
Call our experts for all your Micro-to-Mainframe needs!	

NETWORKING

We carry all the best names including AST RESEARCH and DRCHID TECHNOLOGIES. Call our Networking Applications experts to design a cost-effective device-sharing networked layout for your office!

MONITORS

AMDEK	
300G & 300A (Green or Amber, composite video monitors)	\$129/139
310A (Amber TTL input, non-glare tube)	\$189
COLOR 600 (13" 840 X 240 RGB w/heat button, auto)	\$425
COLOR 700 (13" 720 X 480 RGB w/31mm dot)	\$475
COLOR 710 (13" 720 X 480 RGB, non-gliar, non-flicker)	\$575
PRINCETON GRAPHICS	
PGS MAX-12 (Amber TTL input, non-glare tube)	\$189
PGS HX-12 (690 X 480 RGB w/31mm dot)	\$449
PGS SX-12 (690 X 480 non-interlaced RGB w/31mm dot)	\$489
QUADRAM	
Amberchrome (Amber TTL input, non-glare tube)	*
Outchrome (690 X 480 RGB w/31mm dot)	*
TAXAN	
RGBvision 420 & 440	*
WYSE and KIMTRON (terminals)	*
Ask us to find the right monographics card combo for your application!	

MODEMS

HAYES	
Hayes Smartmodem 300 (external 300 baud, auto answer/dial)	\$299
Hayes Smartmodem 1200 (external 1200 baud, auto answer/dial)	\$499
Hayes Smartmodem 1200S (internal 300/1200, w/Smartcom II)	\$399
ANCHOR AUTOMATION	
Signalman Mark XII (300/1200 baud at 300 baud price)	\$259
VENTEL	
Hail Card (Short-slip 300/1200 baud w/CROSSTALK)	\$429
BIZCOMP	
Intellmodem ST (Fully Hayes compatible internal 300/1200)	\$349
Intellmodem XL (Internal 300/1200, simultaneous voice/data)	\$399
RIXON	
300/1200, 2400, and 4800 baud modems	*

MISCELLANEOUS HARDWARE

POLAROID Palette (Makes color slides from your PC's screen)	\$1295
DRCHID PC Turbo (adds 8MHz processor, multitasking to PC)	\$825
KEYTRONIC KB 5151 keyboard w/separate cursor keys	\$195
TOUCHSTONE TECHNOLOGY Touchstone I (numeric keypad)	*
MOUSE SYSTEMS Optical PC MOUSE w/PAINT, Pop-Up Menus	\$155
MICROSOFT Serial or bus mechanical mouse w/Mouse Menu	\$155
SAIT Power Back-ups (200 and 400 watts)	*
QUADRAM Microchannel Printer Buffer (P/P/S, S/P/S, Bk & up)	from \$135
CURTIS System accessories	*

DISKETTES

VERBATIM	
Single sided/single density	10/24 100/199
Double sided/double density	10/29 100/249
DYSAN	
Double sided/double density	10/29 100/249

SFTWARE

INTEGRATED AND RELATED PACKAGES	
ASHTON-TATE Framework	\$345
LOTUS Symphony	*
MOSES Knowledgebase	from \$250
SPI Open Access	*
SOFTWARE PUBLISHING P's Write, File, Graph, Report	from \$79
WORD PROCESSING	
Samia Word III	*
MULTIMATE comes w/spelling checker and tutorial	\$259
MICROPRO Pro Pak 2000 & 2000 plus	from \$245
MICROSOFT Word w/without Mouse	*
LIFETIME Voicecenter Deluxe w/wordmerge	\$169
SSI WordPerfect	*
SORCIMIUS EasyWriter II System	*
BANK STREET WRITER	\$59
LEADING EDGE Word Processor	\$65
SPREADSHEETS	
LOTUS 1-2-3	*
SORCIMIUS SuperCalc 3	\$195
MICROSOFT Multiplan w/templates	\$139
DATABASE MANAGERS	
ASHTON-TATE dBase II & III	\$295/375
MICROIM 4000 & 6000, w/Report Writer & Coult	*
GMS SYSTEMS Power-base	\$259
DAYFO (Free-form database with opt Reports)	*
QIP Concise Information Processor	*
MICROSTUF Introscope	*
WARNER SOFTWARE The desk organizer	*
COMMUNICATIONS PACKAGES	
MICROSTUF Creaktalk XVI	\$99
PERCOT Smart Term 100, 125, 400	\$95
HAYES SmartCom II	\$95
SOURCE The Source	*
MENLO In Search	*
WESTERN UNION EASYLINK Mail Manager	*
DOW JONES All products	*
ACCOUNTING PACKAGES	
SORCIMIUS Complete accounting modules	from \$299
BPI ACCOUNTING Complete accounting modules	*
REAL WORLD Accounting	*
OPEN SYSTEMS Accounting	*
SYSTEMS PLUS Books' accounting system	*
MECA/TREAS Managing Your Money	\$129
MUNICHGRAM Dollars and Sense	\$119
HOWARD Tax Preparer	*
MICROSTUF tax preparation package	*
GRAPHICS AND CAD PACKAGES	
DESIGN RESOURCES Sigmastar/Chartmaster	\$179/249
BPS Business Graphics	\$259
AUTODESK AutoCAD with or without extensions	*
ZSOFT PC Paint Brush	\$95
PLANNING PACKAGES	
HARVARD Harvard Project Manager	*
MICROSOFT Proact	*
SORCIMIUS SuperProact & Easy Sales Pro	*
LIFELINK The Personal Financial Planner	*
LANGUAGES & COMPILERS	
BOJLAND Turbo Pascal & Turbo	99 \$39
MICROSOFT All products	*
DIGITAL RESEARCH All products	*
LIFELINK Lattice C compiler and C-food Smorgasburg	*
UTILITY PROGRAMS	
BOJLAND Select	\$39
ROSESOFT Prokey 3.0	\$99
FLINK SOFTWARE Sideswys inverts printout	\$45
SOFTSTYLE Set FX + printer utilities	\$35
MOBILE Line 86 assembly language debugger	\$35
NORTON Utilities	\$59
QUAD Copywrite, Disk Explorer & Zero Disk	\$35
CENTRAL POINT Copy II PC copies protected software	\$35
ATI Training	\$55

FOR ORDERS ONLY

*** 1-800-446-7995**

CIRCLE 366 ON READER SERVICE CARD

FOR FURTHER INFORMATION

*** 1-404-446-7995**

HRS: 9AM - 9PM EST, SAT & SUN 12N - 5PM EST.

IBM is a registered trademark of International Business Machines.

**PROGRESSIVE
MICRO
DISTRIBUTORS**

7000 Peachtree Industrial Boulevard
Norcross, Georgia 30071

Folded edge of the page



Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



1. Follow instructions on the other side

Inverted Back



Gbs5ipBack-0018

Back

1. Follow instructions on the other side

HOW TO BUY B

IBM PC SYSTEMS

IBM PC w/256K, two 360K drives, controller, keyboard, monochrome/printer adapter, monochrome monitor	\$2195
IBM PC w/256K, two 360K drives, controller, keyboard, color/graphics adapter, hi res color monitor	\$2495
IBM PC w/256K, two 360K drives, controller, keyboard, 10MB internal hard disk drive w/audio boot	\$2795

These systems are brand new, shipped fully tested and burned in, fully warranted for ninety days AND ARE ALWAYS IN STOCK!

PRINTERS

EPSON FX-80 (160 cps narrow carriage dot matrix)	\$425
FX-100 + (160 cps wide carriage dot matrix)	\$625
RX-80 (100 cps narrow carriage dot matrix)	\$245
RX-80 FT + (100 cps narrow carriage near LQ w/ribbon)	\$295
RX-100 (100 cps wide carriage dot matrix)	\$425
JX-80 (160 cps narrow carriage color dot matrix)	\$575
LD-1500 (LD dot matrix w/ parallel interface)	\$1150

OKIDATA ML 52 (160 cps narrow carriage dot matrix)	\$425
ML 53 (160 cps wide carriage dot matrix)	\$625
ML 54 (200 cps wide carriage dot matrix)	\$725
PACEMARK 2410 (350 cps wide carriage dot matrix)	\$1995

STAR MICRONICS GEMINI 10X (120 cps narrow carriage dot matrix)	*
GEMINI 15X (120 cps wide carriage dot matrix)	*
DELTA, RADIX	*

DATAPRODUCTS 8010, 8020, 8050, 8070	*
---	---

TOSHIBA P-1340 (120 cps narrow carriage LD dot matrix)	\$745
P-1351 (152 cps wide carriage LD dot matrix)	\$1295

TEXAS INSTRUMENTS TI-855 (150 cps narrow carriage LD dot matrix)	\$725
--	-------

BROTHER HR-15 + (17 cps narrow carriage letter quality)	\$395
HR-25 (23 cps wide carriage letter quality)	\$650
HR-35 (32 cps wide carriage letter quality)	\$895

C.ITOH Starwriter (40 cps letter quality)	*
Printmaster (35 cps letter quality)	*

DIABLO 630 API & ECS	*
--------------------------------	---

NEC Pewriter P-2 & P-3	*
Sprinter 2050, 3550, 8850	*

QUME Letter Pro 20 (20 cps narrow carriage letter quality)	*
Sprint 11/40 + & 1/55 + (wide carriage letter quality)	*

Ask about our full line of tractor and cut sheet feeders!

PLOTTERS

AMDEK Amplot II (6 pen Lotus compatible plotter)	\$495
--	-------

HEWLETT-PACKARD HP-1470 & 7475 (2 pens/6 pens)	*
--	---

HOUSTON INSTRUMENTS DMF 25, 40, 40-2, 41, 42, 51, 52	*
--	---

FLOPPY DISK DRIVES

TANDON TM 100-2 (Double sided double density 360K)	\$179
CONTROL DATA (Double sided double density 360K)	\$169
WOLF-HERTZ (PC/XT/AT compatible double sided double density)	*
CHOOSE FROM NAMES LIKE SHUGART, TEAC, PANASONIC	from \$119

HARD DISK DRIVES

PEACHTREE PERIPHERALS, INC F10+e (10MB internal external hard disk with auto boot)	\$795/895
P 20+e (20MB internal/external hard disk with auto boot)	*
P 30 AT (30MB internal AT compatible hard disk)	*

EVEREX, MAYNARD, MITSUBISHI Hard Disks	*
---	---

EMERALD SYSTEMS PC & AT compatible, up to 280MB, with or without tape back-up	*
---	---

SYSGEN Image XT cassette tape back-up	\$745
IG-10 (External 10MB hard disk with tape back-up)	\$2395
IG-20 (External 20MB hard disk with tape back-up)	\$2795

TALL GRASS IG-3070, 3135, 3170 (Hard disks with tape back-up)	*
---	---

BERNOULLI TECHNOLOGY Single and double 10MB removable media subsystems	*
--	---

Call for any brand that you don't see listed!

MULTIFUNCTION CARDS

AST RESEARCH Six Pak w/4K (64-384K, serial, parallel, C/C, opt. game)	\$259
MegaPlus w/4K (64-512K*, serial, parallel, C/C, opt. s.p.)	from \$259
LIO Plus II (Serial, C/C, opt. serial, parallel, game)	from \$135
Advantage (AT compatible memory expansion with options)	*

ORCHARD TECHNOLOGY Bioscan w/4K (64-384K, serial, parallel, C/C, opt. PC Net)	\$259
---	-------

QUADRAM Quadboard w/4K (64-384K, serial, parallel, game, C/C, bracket)	\$259
QuadMeg (AT memory expansion up to 4MB)	*
QuadPort (AT serial and parallel, opt. 4 more serial)	*

PERSYST Time Spectrum w/4K (64-384K, serial, parallel, C/C, 2 yr wty)	*
---	---

MICROLOG Baby Blue II w/4K (64-384K, 200, 2 serial, parallel, C/C)	\$429
Little Red Ram (0-55K memory expansion)	*
PROFIT SYSTEMS and TALLTREE	*

MAYNARD ELECTRONICS Complete line of Sandstar modular multifunction boards	*
--	---

Fill 'er up with RAM and save!

CHIPS

64K (nine chips)	\$35	128K (AT RAM)	*
8087 (coprocessor)	\$159	256K (jr & AT boards)	*

GRAPHICS CARDS

TSUNG LABS UltraPAK (132 col. mono graphics, serial, parallel, C/C)	\$439
UltraRAM, UltraDISK, UltraSERIAL (options for UltraPAK)	*
ColorPAK (Ultra hi res color graphics)	*

PERSYST 800 Board (beautifully clear text on a color monitor)	*
---	---

HERCULES Graphics Card (Lotus compatible monochrome graphics)	\$329
Color Graphics Card (Short-slot color card w/parallel)	\$179

PARADISE Modular Graphics Card & Multi-Display Card	from \$299
---	------------

AST MonoGraphPlus (Monochrome Lotus graphs, parallel, C/C)	\$369
--	-------

STB Graphics Plus II (Monochrome & color w/ parallel, software)	\$369
---	-------

QUADRAM Quadcolor I & II (Upgradable color cards)	from \$169
---	------------

TECMAR Graphics Master (Hi res Lotus compatible color & mono)	*
---	---

OUR POLICY

1. WE ACCEPT VISA, MC, AMEX; No surcharge for VISA or MC.
2. COD requires cash or certified check; Company check when approved.
3. Allow 1 week for personal and company checks to clear.
4. Wiring information available upon request.
5. Corporate, Government and Institutional volume purchase agreements available.
6. Call for exact shipping charges; air shipments take priority.
7. If we must split shipment, you incur no additional shipping charges.
8. All orders shipped insured — No additional charge.
9. All products fully warranted; Some up to 5 years.
10. All items subject to availability; Prices subject to change without notice.

* Call for current price

INDEX TO ADVERTISERS

RS #	Advertisers	Page	RS #	Advertisers	Page	RS #	Advertisers	Page
437	Maynard Electronics	38	499	PC Warehouse	242	*	Softline	81
290	MCP Applications	222	364	PC's Limited	256	514	Softstyle	98
525	MDBS	88-89	527	Personal Computer Products	157	193	Software Solutions	193
311	Micrograft	82				373	Space Coast Systems	326
478	Micromart	70-71	*	Potomac Pacific Engineering	4	538	Statewide Micro Electronics	49
426	Microrim	96-97	*	Potomac Pacific Engineering	331	431	STSC, Inc.	69
338	Microshop	239	123	Precision Data Products	308	214	Summit Software	206
326	Microstuf	26	309	Prentice Hall/Lumen SW	27	*	Sysgen, Inc.	54
333	Microstuf	174	391	The Programmer's Shop	238	441	Systems Management	80
331	Microway	94	366	Progressive Micro Distributors	321-323	501	Tecmar Inc.	C-2
340	MLI Microsystems	308	124	Progressive Micro Distributors	28	502	Tecmar Inc.	C-4
530	MOM Corp.	251	537	Qic Research	9	204	Telasoft	161
293	Mountain Computer	45	486	Quadram Corp.	220	387	TeleLearning Systems	87
105	NBS, Inc.	308	*	Quaid Software Limited	206	*	Texas Instruments	C-3
*	NEC Information Systems, Inc.	179-182	356	Qubié	59	138	Thesys Memory Products Corp.	17
370	NewsNet	208	383	Qubié	61	353	Topaz	22
120	Northeastern Software	252	420	RealWorld Software	5	507	Touchstone Technology, Inc.	20
346	Norton Utilities	271	155	Reference Desk Software	318	170	Traband Associates	308
268	Nostradamus	63	*	Safeware	98	517	Transtector Systems	201
412	Orchid Technology	44	154	Satellite Software International	46	156	Tripplite	327
351	Oryx Systems, Inc.	78-79	470	SBT Corp.	16	207	Tseng Laboratories, Inc.	32
363	Oryx Systems, Inc.	78-79	187	Sigma Designs	72	540	Tseng Laboratories	224
*	Paradise Systems, Inc.	215	126	SoftCraft, Inc.	186	475	Vertex Systems	153
141	PC Brand	18-19				*	Warehouse Data Products	100
339	PC Connection	166-169				494	Xanaro Technologies, Inc.	2-3
535	PC Network	278-279				509	XY Quest	99
533	PC Products	12						

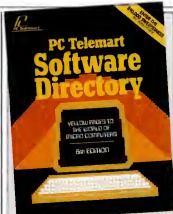
Apple to ZDOS: Where to Find It

Searching in the dark for the PC Telemart Software Directory, you could pick up the phone book by mistake. If you only care about IBM-compatible software, try the slimmer Que guide.

Since the *PC Telemart Software Directory: Yellow Pages to the World of Microcomputers* (8th edition) is fashioned after a phone book as fat as the Manhattan version, the fact that it's comprehensive comes as no surprise.

The 1,300-page book lists software for nearly every operating system and computer on the market. In addition to including widely known operating systems like PC-DOS and CP/M, the directory also lists rare types such as MMOST and ZDOS. It complements guides available for the PC alone.

In the unlikely event you cannot find the software you want here, you may be able to find a similar program that works with another operating system and query the vendor to find out whether it plans to



release a version for the PC.

It's difficult to estimate exactly how many products that the guide lists will run on the PC, XT, or compatibles. Nevertheless, the summary is a good place to start. It shows 2,361 general business applications for the PC, 623 programming tools, 423 educational products, 148 products for the home, and 607 vertical market products. Entries for such compatibles as the Compaq, Columbia, and Eagle raise the listings by several hundred.

The book is organized under major categories such as general business software, programming tools, educational software, home and personal use software, and specialized vertical-market software. Within

these categories, products are broken down by applications; within applications, by specific functions; and within functions, by operating system and product name. A product called *Graftalk*, for example, is listed under "General business software; business graphics; graphics, general; PC-DOS operating systems." Each listing includes the vendor's name and product price but no descriptive information about the package.

Handy Indexes

Several indexes and additional sections increase the book's usefulness. The vertical-market category listing describes the general nature of those products, and a computer technology glossary provides a convenient reference source for many terms. An 80-page product index lists all products by their proper name, and a 26-page vendor index covers individual vendors. In phone-book fashion, the book includes "Yellow Pages" that list vendor addresses and telephone numbers, along with display ads.

A subject index is also included but, unfortunately, it's not comprehensive. The indexes and the book's overall organization make it fairly easy to use, although a comprehensive index would add immeasurably to the book's usefulness.

The large number of listings probably mean that very few products have been

PC

**PC Telemart Software Directory:
Yellow Pages to the World of
Microcomputers, 8th Edition**

R. R. Bowker
(formerly published by PC Telemart, Inc.)
205 East 42d St.

New York, NY 10017
(212) 916-1728

Copyright: 1984

Cover Price: \$39.95

ISBN: 0-88674-006-1

CIRCLE 696 ON READER SERVICE CARD

BOOK REVIEW

overlooked—at least, as of the publication date. Bear in mind, though, that the general rule for using any of these directories should be: If you don't find a product in one directory, try looking in at least one other directory.

Several indexes and additional sections increase the book's usefulness.

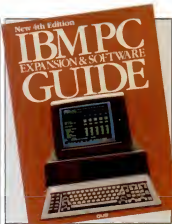
All in all, this is a well-done directory that will deliver a good value to buyers. It should be particularly useful to those seeking a software product for non-PC-compatible hardware.

A Guide from Que Corporation

The IBM PC Expansion & Software Guide by Que Corporation has 851 pages and covers only products that run on PC-compatibles. This edition, which came out in August 1984, lists 3,655 software products from 1,085 vendors, 874 hardware products from 281 vendors, and 7,605 products in supplies and services categories from 265 vendors. This may well be the most comprehensive software directory of its kind.

Among the major listings are hardware, software products, supplies and services, IBM PC dealers, and service/exchange centers. Each is further broken down into several useful subcategories.

In the software category, for example, you'll find subheadings such as systems software, language software, accounting software, communications, data manage-



ment, and educational. Categories are broken down further; communications offerings for example, include asynchronous, bisynchronous, and LAN.

Memo to IBM users

SUBJECT:
Put 8 IBM's
on the CUBE and
take 42 big
(mega) bytes



METHOD:
Using the 808 MULTIPLEXER illustrated.

RELEVANT DATA:

- 808 MicroCube Winchester Mass Storage System for IBM PC's and XT's holds 6, 10, 21, and 42 MB. Uses RODIME 644" Winchester Hard Disc Drives.
- 808 Micro-Multiplexer for IBM PC's and XT's supports 8 IBM's — 16 with extender.
- 808-TS-60 High Speed Tape Streamer Backup stores 42 MB on tape in 9 minutes.

CONCLUSION:

Order through IBM dealer or get more information by enclosing business card with this memo and send to:



Space Coast Systems, Inc.

301 S. Washington Ave., Dept. C • Titusville, FL 32796
305-268-0672 • Telex 701506

CIRCLE 373 ON READER SERVICE CARD

Copies everything



Our monthly trade-in plan guarantees you can always copy everything!

Personal Copier makes sure you're always up-to-date with the new and ever-changing protection methods. You won't find an easier system. It's fully automatic, with easy-to-use two-step graphic screen instructions. Anyone can use it — every IBM PC user should have one. Order your Personal Copier today \$39.95 plus \$3.00 shipping and handling.

personal
Copier™
from

DISKTECH

P.O. Box 162 • Wasco, IL 60183

312/365-2803



BOOK REVIEW

Start Here

The listings themselves include basic information about the product's capabilities, vendor name and address, hardware requirements, and price. Although the listings are necessarily short, they are a good starting place for gathering information about products.

This directory also has several listings not found in similar directories. These include listings of books about the PC, supplies and services (consulting, training, and the like), IBM PC dealers, and service/exchange centers. Unfortunately, these sections are a bit weak and seem superfluous since supply catalogs stuff the

This directory is
put together with
attention and
care.

mailboxes of all subscribers to industry publications. Also, the retailer and consultant listings are far from complete.

A 30-page index lists all products mentioned in the book in alphabetical order, and a similar section provides a quick profile of all vendors listed.

I consider this directory one of the most comprehensive, put together with attention and care. The *IBM PC Expansion & Software Guide* is a directory to be trusted.



IBM PC Expansion & Software Guide, 4th Edition

Que Corporation
7999 Knue Road, #202
Indianapolis, IN 46250
(800) 428-5331
(317) 842-7162
Copyright: 1984
Cover Price: \$19.95
ISBN: 0-88022-067-8

CIRCLE 695 ON READER SERVICE CARD

The Que directory's attributes make it an important addition to the desk of anyone who buys products for the PC. In addition, at \$19.95, it's among the least

expensive directories—a final selling point. That makes it a must-buy item for all PC users who want to find additional software for their machines. ■

We've Got Guts!!



Compare

Open up any competitor's model and compare it to the Isobar photo . . . You can really see the difference!

Don't be short changed by inexpensively designed "protection"!

ISOBAR: The Most Advanced Power Line Filter to Protect Your Computer . . . And the ONLY surge suppressor to protect your system from itself!

Only Isobar gives you:

1. 17 active electronic filtering components to REALLY protect your computer system.
2. Individual filter banks with multiple filtering components to safeguard against any interaction between their C. P. U. and printer.
3. Superior RFI/EMI noise suppression and rejection.
4. U.L. listed, AC surge suppressor with full recognition by Underwriters Laboratory not just as an extension cord or spike suppressor but also as an electronic noise suppressor.

What does full Isobar protection cost?

LIST \$59.95 (two outlets) LIST \$79.95 (four outlets) LIST \$109.95 (eight outlets)



Call 1-312-329-1777
500 North Orleans St., Chicago, IL 60610

Est. 1922

CIRCLE 156 ON READER SERVICE CARD

PROGRAMMER'S GUIDE TO CP/M[®]

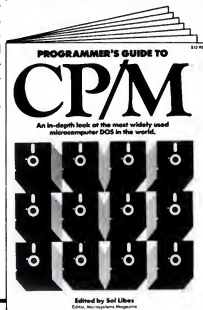
Edited by Sol Libes

Here's an important collection of CP/M insights that you'll never find in any CP/M manual. CP/M is the most popular microcomputer DOS in use today, and this widespread use has generated many innovative techniques and enhancements of CP/M. *Programmer's Guide to CP/M* tells you what these enhancements are and how to put them to use, how to get around apparent limitations of a CP/M system and why CP/M is far more versatile than you might have imagined. Every article in *Programmer's Guide to CP/M* originally appeared in MICROSYSTEMS between

January 1980 and February 1982. Except for this collection, these articles are now unavailable! *Programmer's Guide to CP/M* gives you an in-depth look at CP/M from the viewpoint of the programmer—the individual who creates the software that interfaces directly with CP/M, or who is installing CP/M on systems for which configurations do not already exist.

Contents include "An Introduction to CP/M," "The CP/M Connection," "CP/M Software Reviews," "CP/M Utilities & Enhancement," "CP/M 86" and "CP/M Software Directories." \$12.95.

Also available at your
local bookstore or
computer store.



For faster service,
PHONE TOLL FREE
800-631-8112
(In NJ only:
201-540-0445)

CP/M is a registered trademark of Digital Research, Inc.

MICROSYSTEMS PRESS

Dept. FL7F • 39 East Hanover Avenue • Morris Plains, NJ 07950

Please send me _____ *Programmer's Guide to CP/M* at \$12.95* plus \$2.00 postage and handling each. Outside USA add \$3.00 per order. #14C

☐ **PAYMENT ENCLOSED** \$_____. *Residents of CA, NJ and NY State add applicable sales tax.

☐ **CHARGE MY:**
(Charge and phone orders \$10 minimum.)

☐ American Express

☐ MasterCard ☐ Visa

Card No. _____ Exp. Date _____

Signature _____

Mr./Mrs./Ms. _____
(please print full name)

Print Name _____

Address _____ Apt. _____

City _____

State _____ Zip _____

☐ Send me a FREE Creative Computing Catalog.

Typesetting For Writers

Bypassing the manuscript stage is the wave of the future, and writers who learn the basics of typesetting can now electronically communicate their copy to their publishers and typesetters.

The days when writers can hand in stories and articles on paper may soon be numbered. Increasingly, publishers and typesetters are asking writers to submit text on disk or via modem. Since publishers save money by receiving copy electronically, they often offer writers a premium for supplying copy on readable and usable files. In order to cash in, though, writers need to learn the basic rules of typesetting to ensure that the publishers get exactly what they need.

Certain factors can make your disk or telecommunicated text useless to a publisher. For example, not all word processors save files in the same way. Most either format the file to their own peculiar character-handling system or contain control codes for indents, underlining, and forced line endings. These codes could be non-ASCII characters and therefore indistinguishable by ASCII file readers.

Many word processors do, however, allow you to save a file in ASCII format without control codes. Even if you write your article in the normal fashion, you should be sure you send the publisher a "clean" ASCII file.

This is important because the publisher will edit your text and then format it for conversion to typeset galley. Text files with centered lines, paragraph



indents, underlining, boldface type, and other formatting elements are essentially useless to the publisher.

If your article contains formatting elements, the publisher will have to go into the file to remove them, destroying the advantage of supplying the text electronically. Keep in mind this simple rule: Just write and let the publisher worry about indents, line spacing, and underlining. If you think you must emphasize words, send along a marked-up printout.

The best arrangement is for you and your publisher to share compatible computers (so disks can be exchanged), but publishers with compatible computers can still use your ASCII file if you tele-

communicate it to them; of course, the same rules that apply to formatting your file on disk apply to telecommunications.

Because of the technical differences, often the most difficult way to telecommunicate a file to a publisher is the obvious one—a direct link between your computer and the publisher's. This requires both of your modems to have the same baud rate, parity, and protocol, and you must both be at your respective computers when transmitting. As a result, many publishers take advantage of electronic mail services instead.

The easiest and least expensive way for a publisher to retrieve a file is via a

WRITING

mail service. This reduces long-distance charges, bringing the cost down to as low as \$1 per document if both parties are subscribers.

Typesetting

Just as in preparing to transfer data, the first step in preparing your text file for typesetting is to make sure that the file is in ASCII format and that all word-processor-induced format codes have been removed. For typesetting, the file must have no margins on the top, bottom, or left side. If you send a typesetter a file with a 5-character left margin, for example, the typesetter will read those spaces as part of the text. The typeset version will have margins different from your original, and so when the typesetting device reads your file, it will include the 5-character spaces no matter where in the typeset line they fall.

A Space Oddity

Unlike typewritten and word-processed documents, typesetters use one space between sentences instead of two. When writing documents to be typeset, remember to place only one space after periods (also commas and colons). If you use two spaces, you'll end up with too much space between sentences.

You should also remember that typesetters don't use spaces to indent a paragraph. Instead, they indicate paragraph breaks by placing a typesetting code at the beginning of each paragraph. If you insert spaces, it will only result in problems in the typesetting process.

Finally, typesetting equipment does not understand codes for underlining, boldface, or tabs. If you include such commands, they will not be recognized by a typesetter as such but will be interpreted in other ways.

Do It Yourself

Taking this process a step further, more and more authors and writers are using specialized electronic typographic services to typeset their own material.

Such services require that you embed typesetting codes into your files. To do this properly, you have to know how to ensure that your type will be set in the size and face you want.

Intergraphics, Inc., of Alexandria, Virginia, offers a low-cost version of this typesetting service using telecommunicated ASCII text files with embedded typesetting codes. Intergraphics then runs the file through its typesetting ma-

The first step in preparing your text file for typesetting is to make sure it is in ASCII format.

chine, sets the text according to your typesetting codes, and then mails you the galleys. It has a \$5 minimum and charges a flat rate of \$2 per thousand characters plus shipping.

Book Learning

Intergraphics does not provide direct-contact support, but it does sell a thorough manual for \$15 that will answer most of your questions. You must study the manual to learn how to embed the proper typesetting codes in your files. Remember that you will be charged for correcting your own coding mistakes. If you are unsure about the coding, send a portion of the file as a test. If it comes back correctly, send the whole file.

The Intergraphics *High-Tech Typesetting* manual is a comprehensive, 224-page book that provides a basic guide to typesetting, a full description of how to embed codes, all the codes you need to know, a list of available typefaces, and hints on how to create files that work well with the system.

The manual first takes you through the basics of typesetting, such as illustrating

various point sizes, column widths, line spacing, and typefaces. It then illustrates how to embed codes into your text file to make the typesetter set your text at the desired size, style, line spacing, and column width.

The process of embedding codes requires that you place simple coding inside braces ({}). Because every computer has an ASCII character for braces, this system accommodates all computer users. Whenever you wish to start or change something, you place a command inside braces at that point in the text. For example, to start typesetting, you would begin with a headline, and you would place a command inside the braces immediately before the headline in your text file. A headline that you want to put in 24-point Helvetica bold would read as follows in your text file:

```
{f385}p24{ql}Headline Type
```

In this example, *f* stands for the typeface, *p* stands for the point size of the type, and *ql* stands for quad left, a typesetting term that simply means flush left. When coding type, remember that once you issue a command, it will continue until you issue another.

Commands allow you to choose the point sizes of the type from 4.5 to 72, line spacing of any configuration, column widths up to 46 picas (slightly more than 7 inches), flush left or flush right margins, justification, centering, hyphenation, dashes, rules, symbols, indents, tabs, and control over letter and word spacing.

Embedding typesetting commands is as easy as embedding dot commands in *WordStar*, and it uses the same process. If you can master a word processing program, typesetting procedures will be a breeze to learn.

This trend is coming, whether you're ready for it or not, and by learning the technical niceties of communicating with publishers and typesetters, you can save yourself a great deal of grief, not to mention money. ■



Coming Up



Need Help Preparing Your Taxes?

Can tax software packages take the place of your CPA? Do they really take the drudgery out of tax preparations? How useful are they? How good? Do they save you money? *PC Magazine* and Price Waterhouse combine their expertise to answer these questions and run a fine-tooth comb through tax packages for the PC. We'll look at four categories of tax packages: those designed for planning, preparation, tax information, and tax record keeping. Tax packages we'll review include *Dollars and Sense*, *Managing Your Money*, *The Financier Tax Series*, *Tax Decisions*, and *TurboTax*.

We'll also chart some of the most important features of the packages so that you can see at a glance which one tax program conforms most closely to your needs.

DATA GENERAL/One

The DATA GENERAL/One is a cute little portable computer that weighs just under 10 pounds. It comes with a full-size screen, a built-in 300-baud modem, two 3½-inch floppy drives, rechargeable batteries, a 4-pound thermal printer, a separate 5¼-inch floppy disk drive, and several software packages. The manufacturer bills this machine as the personal computer system for people on the go. But since its carrying case has space for neither the separate floppy drive, nor the printer, can the system fulfill the manufacturer's promise?

UniForm

PC has found a solution to the DOS-CP/M compatibility problem. *UniForm* allows you to move data between the two kinds of machines by making one of your PC's floppy drives emulate a drive from any one of 30 CP/M-based machines. It allows your applications program to work directly with files on the CP/M-formatted disk.

Virtual Memory Systems

Bruce Owen takes you on a tour of virtual memory systems, which are special memory boards that use a flexible addressing scheme called bank switching to put up to 16 megabytes of RAM on a single PC.

FREE 7,500 WORDS

MORE THAN ANY BOOK!

VOCABULARY BUILDER

- 7,500 OF THE MOST COMMON WORDS
- SHOWS WORDS CORRECT AND WORDS MISSED
- WILL NOT REPEAT WORDS YOU'VE LEARNED
- VOCABULARY FROM GRADE 8 TO ADULT
- PRINTS OUT WORDS TO TAKE WITH YOU AND STUDY ANYWHERE

AND SPELLING TEACHER

- LEARN TO SPELL EVERYDAY WORDS CORRECTLY
- KEEPS TRACK OF CORRECT WORDS
- WILL REPEAT MISPELLED WORDS
- BASIC SOURCE CODE & COMPILED VERSION INCLUDED

AND FLASH CARDS

- ALLOWS YOU TO CREATE A QUICK STUDY AID
- SET UP THE CARDS TO YOUR BEST ADVANTAGE
- CHOOSE YOUR OWN TOPIC
- MULTIPLE CHOICE OR FLASH CARDS

SUPERIOR IN SEVERAL AREAS

This program will allow you to increase your knowledge of the English language. This program can be used for personal and educational improvement.

It can help you receive better grades, higher SAT scores and improved business power.

It is flexible for all age groups. Any person of any age can make use of this to advance their vocabulary and themselves. This computer program and enables you to return your problem words automatically, over and over. A book may wear out, fly, or become too marked up to be helpful. This program will last for as long as you need and with the flash cards, you can continually increase the levels of difficulty and your comprehension.

- for IBM PC, XT, AT, and 128K
- Comes with 128K
- Manual is on disk

NO STRINGS ATTACHED

You do not have to buy anything else to use the system. We don't even sell any software (except for the case of the disk & hardware). We developed the program for our own use. We are not selling the program because we do not want to be in the software publishing business. We are giving the program away at a public service & for the good quality. The \$20 has to cover the cost of the disk and the advertising as we are not taking any money on this offer.

MORE FREE SOFTWARE ON PAGE FOUR

PPE

POTOMAC PACIFIC ENGINEERING INC.
Box 2027 Germantown, MD 20876 (301) 377-1486

- * Copy the system from someone who already has one OK
- * For the latest most powerful addition send \$20 to cover the cost of a 3.50 disk for disk mail, envelope, copying & handling
- * Available on 5.25 disk, \$10 extra
- * Quoted USA and \$5. MD residents add 5% tax
- * Allow 2 to 3 weeks for delivery

Please send Potomac Pacific Engineering's Educational Software Package to:

Name _____

Street _____

City/State/Zip _____

Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • XEROX™



The VERSABUSINESS™ Series

Each VERSABUSINESS module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSA RECEIVABLES™

\$99.95

VERSA RECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSA RECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSA PAYABLES™

\$99.95

VERSA PAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSA PAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSA PAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSA PAYROLL™

\$99.95

VERSA PAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSA INVENTORY™

\$99.95

VERSA INVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSA INVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a general reorder point, and allows you to enter and print invoices directly or to link with the Versa-BUSINESS™ system. VERSA INVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

VERSA LEDGER II™

\$149.95

VERSA LEDGER II™ is a complete accounting system that grows as your business grows. VERSA LEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system without any additional software.

- VERSA LEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSA LEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VersaLEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

CIRCLE 260 ON READER SERVICE CARD

SATISFACTION GUARANTEED!

Every VERSABUSINESS™ module is guaranteed to outperform all other competitive systems, and at a fraction of their cost! If you are not satisfied with any VERSABUSINESS™ module, you may return it within 30 days for a refund. Manuals for any VERSABUSINESS™ module may be purchased for \$25 each; credit toward a later purchase of that module.

To Order: Write or call Toll-free (800) 431-2818 (N.Y.S. residents call 914-425-1535)

* add \$3 for shipping in UPS areas * add \$5 to CANADA or MEXICO
* add \$4 for C.O.D. or non UPS areas * add proper postage elsewhere

DEALER INQUIRIES WELCOME

All prices and specifications subject to change. Delivery subject to availability.

COMPUTRONICS

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. * APPLE is a trademark of Apple Corp. * IBM is a trademark of IBM Corp. * OSBORNE is a trademark of Osborne Corp. * CP/M is a trademark of Digital Research. * XEROX is a trademark of Xerox Corp.

**The TI 855 is
the only printer
with letter quality,
draft speed,
graphics,
plug-in font
modules...
all for under
\$1000.** (suggested retail price)



Finally, the printer for all PC needs.

The TI 855 printer. The printer for all major PC's. See for yourself today. Call 1-800-527-3500 for the dealer nearest you.




**TEXAS
INSTRUMENTS**
Creating useful products
and services for you.

Now make your PC paint.



Make it draw. Shade. Color. Erase. Create perfect circles. Ellipses. Rectangles. With the touch of a button. Print on screen and off in a variety of type fonts. Gothic. Roman. Old English. Script. Print in light. Medium. Bold. Italicize. Underline. Outline. Kern. Make it print in a wide range

of point sizes. Make it cut. Make it paste. Make it all happen in one package. With Tecmar's Graphics Master™ Board and PC Paintbrush* Software.

Make a trip to your dealer for a demonstration. Or, make a call to Tecmar for the dealer nearest you. (216) 349-0600.



Tecmar
THE POWER BEHIND THE PC

*Registered trademark of the ZSoft Corp.